

0004



JON M. HUNTSMAN, JR.  
Governor

GARY R. HERBERT  
Lieutenant Governor

# State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER  
Executive Director

Division of Oil, Gas and Mining

JOHN R. BAZA  
Division Director

# COPY

Outgoing  
C0250005  
OK  
#3100

April 20, 2009

Chris McCourt, Manager  
Alton Coal Development, LLC  
463 North 100 West, Suite 1  
Cedar City, Utah 84720

**Subject: Technical Review, Alton Coal Development, LLC, Coal Hollow Mine Permit Application Package, C/025/0005, Task ID #3100, Outgoing File**

Dear Mr. McCourt:

We have conducted a technical review of your application (dated December 22, 2008) which is supplemental to that received January 24, 2008 and June 14, 2008, for a 635-acre surface coal mining operation near Alton, Utah. Several deficiencies were identified with the permit application package (PAP). They are attached along with our technical analysis. In accordance with R645-300-131.100, the Division requests that you modify your application to address these deficiencies.

Priscilla Burton at the Price Field Office has been assigned as the review team lead. Please contact Ms. Burton at (435) 613-3733 or myself (801) 538-5325 with your questions.

Sincerely,

Daron R. Haddock  
Permit Supervisor

PWB:ss  
Enclosure  
cc: Price Field Office  
O:\0250005.COL\FINAL\WG3100\editeddef3100.doc

File in:  
C:\0250005\2009 Outgoing  
Refer to:  
☐ Confidential  
☐ Shelf  
☒ Expandable  
Date: 4/20/09 For additional information



**DEFICIENCY LIST**  
**Task ID #3100**

**PB**= Priscilla Burton  
**DWD**= Dave Darby  
**JH**= Joe Helfrich  
**JS**= Jim Smith  
**PH** = Pete Hess  
**SW** = Susan White

**R645-103-234.100, Refer to Legal Description and Status of Unsuitability Claims Findings, p. 9 of the TA.** The Applicant must provide documentation that the mine has approval from the road authority to temporarily close K3993. [SW]• Appendix 1-7 County Road Agreement for relocation of K3900 must include all exhibits that constitute the entire agreement as stated on the signature page of the agreement. [PB]

**R645-103-234.200 and R645-300-123.400, Refer to Legal Description and Status of Unsuitability Claims Findings, p. 9 of the TA.** Ownership or public easement for the unimproved road running east/west along Robinson Creek (K3993) should be described in the MRP (or public easement, if any). [SW]

**R645-301-115.100, Refer to Legal Description and Status of Unsuitability Claims Findings, p. 9 of the TA.** The Applicant must acquire a zone modification or conditional use permit for mining in an Agricultural Zone from the Kane County Planning Commission. [SW]

**R645-301-121.200, Refer to AVF Findings, p. 47 of the TA.** The plan states in Chap 7, p. 7-2, last paragraph, that there are no domestic supply wells within the permit area, however there may be domestic water rights on a spring within the permit area, according to the last paragraph on page 8 of App. 7-1 which states that SP-35 is used seasonally for domestic use. SP-35 is shown on Dwg 7-1 within the permit area. Please make the appropriate correction to the narrative, plate or appendix. • Please provide information on well C5 in Table 8, App. 7-1. • Instructions included with the application dated 12/18/2008 indicated that Table 7-7 was to be replaced with a new Table 7-7. However, Table 7-7 was replaced by Tables 7-7A and 7-7B on January 24, 2008. Please either re-name Table 7-7 to replace an existing table or specify the existing Table that is to be replaced by Table 7-7. • References made on p. 7-4 to cross section Y-Y' in Dwg. 6-9 and elsewhere in the application appear to be incorrect. There is a cross section X-X'

File in:

☐ Confidential

☐ Shelf

☒ Expandable

Refer to Record No. 0004 Date 04/20/2009

In C 0450005 2009 Outgoing  
For additional information

on Dwg. 6-9 dated 12/24/2008, however information received on December 12, 2008 replaced Dwg. 6-9 with a new drawing that does not include a cross-section. Please verify the reference and make the appropriate corrections to the application. • The permit boundary should be shown on Plate 1 for ease of comparison with other (larger scale) plates (repeated request from Task 2910). • Crop land east of the proposed permit area is illustrated on Ex. 4.1. Acreage under production was not provided, and Ex. 4.1 has no scale, so that acreage can not be calculated. Please provide a scale on Ex. 4.1 and indicate the acreage under production for Johnson, Sorensen, Dame and Pugh lands (similar to request from Task 2910). • Dwg. 7-7 was field checked in September 2007 and several modifications should have been made to reflect the increased area under cultivation owned by Sorensen, to clarify the pond structures 29-6 through 29-9 are semi-circle dams, to place the Dame fenceline adjacent to the road, etc. • Dwg. 7-7 of irrigation structures should be drawn on the same scale as Dwg. 7-2, so that the point of diversion on Robinson Creek could be known in relation to the monitoring point SW 4; and so that the monitoring point for Water Canyon (RID-1) can be seen in relation to the Water Canyon diversion to the Pugh pasture. These relationships must be shown to confirm that monitoring accurately portrays the water supply. (repeated request from Task 2910). • Dwg. 7-7 should indicate the location of Dames irrigation structures for 93 irrigated acres and Johnson's irrigation structures for 4.82 acres. • The survey of subirrigated lands shown on Dwg. 7-7 should be extended to include all of Section 32. • The map legend for Dwg 7-7 should include the key for irrigated and subirrigated areas etc., rather than having those markings listed separately from the map legend • Make Dwg. 7-3, Water Rights, more informative by identifying the water right associated with each colored stream reach. [PB]

**R645-301-234.230, Refer to Stabilization of Surface Areas Findings p. 156 of the**

**TA:** Repeated from Task 2910. The application should clearly state the timetable for final grading of the excess spoil pile. Will final grading of the spoil pile be concurrent with construction of the pile, such that the 2.7 million cubic yards of spoil from pits 1 – 3 that are placed on the unmined area will receive final grading, while overburden from pits 4 – 8 is placed in the mined area? (Repeated from Task 2910). • The seeding schedule is alternately described as immediately following topsoil application (pg. 2-27 and pg 5-57) or as seasonal in nature (p. 5-58) mainly occurring in early spring and late fall (pg. 2-27). Seeding of the spoil piles is described only for piles that exist longer than a year (Sec. 528.310, p. 5-40.) The application should specify in Chapter 2 and Chapter 5 that seeding will immediately follow topsoil application, regardless of season. [PB]

**R645-301-244.100, Refer to Topsoil and Subsoil Findings, p. 105 of the TA:**

The Applicant states in Section 234.230 that other measures approved by UDOGM may be implemented to provide stockpiles protection from wind and water erosion. The Division has established that surface roughening is an effective way to prevent water erosion from occurring on steep slopes (see

[https://fs.ogm.utah.gov/PUB/MINES/Coal\\_Related/RecMan/Reclamation\\_Manual.pdf](https://fs.ogm.utah.gov/PUB/MINES/Coal_Related/RecMan/Reclamation_Manual.pdf)). The Applicant must describe the use of surface roughening on all temporary and long term stockpiles (spoil, topsoil and subsoil piles). This request repeated from Task 2910 review. [PB]

**R645-301-321.220 and R645-301-321.200, Refer to Alluvial Valley Floor Findings, p. 48 of the TA:** Appendix 7-7 and Chapter 3 provides the consultant's estimates of land productivity. Average yield data reported for high levels of management must also be provided in the environmental analysis. Current data may be available from the USDA or an appropriate state natural resource or agricultural agency. [PB]

**R645-301-322.200, Refer to Wildlife Resources Findings, p. 27 of the TA:** In 2006 UDWR changed the terms utilized for habitat designations. The term "high-value" habitat are now designated as "crucial", the new designation needs to be noted in the appropriate section(s) of the application. [JH]

**R645-301-322.210, Refer to Fish and Wildlife Resources Findings, p. 100 of the TA: Bald and Golden Eagles.** This section needs to include a narrative about each species including their status within ½ mile of the proposed disturbed area.

**R645-301-323, Refer to Maps Plans and Cross Sections of Reclamation Operations Findings, p. 160 of the TA:** The application needs to include Reclamation Monitoring And Sampling Location Maps and Reclamation Treatments Maps. Drawing 3-1 includes the location of the reference areas where vegetation was sampled prior to disturbance and will be sampled post reclamation. Drawing 3-1 needs to include the post reclamation sampling locations of the reclaimed area. •The applicant should also address the remaining portions of R645-301-323 in consultation with the Division. The portions include 323.200, 300, and 400. •For Reclamation Treatments Maps the reviewer is referred to Drawing 5-20 and 5-20A. 5-20 shows the location of the temporary diversion in Robinson Creek and is adequate to show the reclamation treatments for Robinson Creek, but the application needs to include the reclamation treatment maps for the other reclaimed areas, showing topography and delineation of areas where a different seed mixes or rate of application is proposed, such as sage grouse habitat and pasture restoration. [JH] • **Refer to Fish and Wildlife Resources Findings, p. 27 of the TA:** Drawing 3-1 Vegetation Map and Dwgs. 3-2 through 3-5 (wildlife maps) need to be revised to include the proposed location of the temporary county road realignment. [JH]

**R645-301-330, Refer to Fish and Wildlife Resources Findings, p. 100 of the TA: Wetlands and Habitats of Unusually High Value for Fish and Wildlife.** Page 3-73 refers the reviewer to page 3-40 of the application for protection measures for wetland areas. The information on page 3-40 does not describe protection and enhancement measures for the wetland areas. Section 333, as noted by the



Applicant, needs to include the protection and enhancement measures for wet meadow areas during active mining operations. [JH]

**R645-301-333, Refer to Fish and Wildlife Resources Findings, p. 100 of the TA:**

Protection and Enhancement Plan. **Protection.** The application needs to include a wildlife awareness program for the employees that include avoidance, harassment situations in transportation corridors and speed limits. For the affected areas within the Division's scope of responsibility, the awareness program needs to include measures to efficiently monitor, (truck drivers could maintain a log of animals hit and/or killed), and remove road kill by haul trucks, including but not necessarily limited to: mule deer, elk, sage grouse, other birds and smaller animals. For example, some mining companies have offered to contribute to the DWR's road kill clean up program. • The application needs to include a predator control plan that addresses how wildlife species and human activity will be managed to protect Sage Grouse. [JH]

**R645-301-341.230, Refer to Vegetation Reclamation Findings, p. 154 of the TA:**

According to the Application, mulch will not be applied to the reclaimed pastureland. The beneficial uses for mulch are outlined in the United States Department of Agriculture research paper, Reclamation on Utah's Emery and Alton coal fields: Techniques and Plant Materials, INT-335, June 1985, page 24, "At the end of the first growing season, frequency of grass plants averaged 92 percent on the ripped area where hay had been rotovated into the soil surface compared to 52 percent on ripped areas receiving no hay amendment. The application must include a commitment to apply mulch or soil amendments for the pastureland areas. • The applicant also needs to explain how water will initially get to the reclaimed pasture areas, as there are no commitments in the plan to irrigate these reclaimed areas. [JH]

**R645-301-342, Refer to Fish and Wildlife Resources Findings, p. 100 of the TA:**

Protection and Enhancement Plan. **Enhancement.** Chapter 3, p. 3-48, "Sagebrush and Other Habitats", includes some information about wildlife species during reclamation but does not include a narrative that describes how impacts to the habitat for the high value (crucial) wildlife species, black bear, rocky mountain elk, and mule deer will be mitigated during the active phase of mining operations. The applicant could describe the beneficial uses to the referenced species that have been achieved to date by the removal of the Pinyon Juniper. A comparison of acreages of the disturbed area footprint versus habitat enhancement should be included in the application. [JH]

**R645-301-322, -301-333, -301-342, -301-358, Refer to Fish and Wildlife Resources Findings, p. 101 of the TA: The following deficiencies pertain to Chapter Three.**

The application needs to include a commitment not to disturb the lek during the breeding season including some buffer. The application states on page 3-43,

“...mining activities will be minimized so that the lowest disturbance will be created during the breeding season at areas adjacent to the original lek”. The term “minimized” is too subjective and “lowest disturbance” needs to be defined. The application must provide specific provisions to avoid the lek during the breeding season. • Livestock grazing is not acceptable as sage-grouse mitigation as suggest on p. 3-43. Example: During the October 1, 2 tour of Robinson creek; it was obvious that the landowner actively partakes in sage-brush removal treatments (maybe the herbicide spike?). Further, excessive soil compaction and almost complete lack of understory (other than non-native cow forage like crested wheat-grass) indicate a heavily overgrazed pasture. This pre-mining land use is in no way beneficial to sage-grouse. The applicant needs to revise this section of the application. •Page 3-46. Establishment of a Core Sage-Grouse Conservation Area. The applicant needs to initiate treatments to this area to the maximum extent feasible, as soon as possible. These treatments take time, at least a couple of years. Given the timeline to excavate the coal, these treatments need to happen as soon as possible, and the area needs to be rested from cattle grazing (standard is typically at least two years of resting) to ensure establishment of planted forbs and grasses. [JH]

**R645-301-322, -301-333, -301-342, -301-358, Refer to Fish and Wildlife Resources Findings, p. 100 of the TA: The following deficiencies pertain to Appendix 3-1 Alton Sage-Grouse Habitat Assessment and Mitigation Plan.**

The applicant needs to describe how the Conservation Area will be enhanced for Sage-Grouse especially during the breeding season. • Areas to be cleared of young juniper trees need to be identified. • Drawing 3-5, Sage Grouse brood habitat and Conservation area map, identifies the location of the 72 acre juniper removal plot. The intact sagebrush and surrounding juniper woodland areas need to be identified. •A time line for implementation needs to be included for the removal of young junipers and the cutting back of the juniper woodlands. • Areas where “juniper woodlands surrounding intact stands can be cut back to increase patch size and the amount of area that has potential for nest site selection by hens” must be identified on a vegetation map and quantified in terms of acreages. •The application needs to include a clear, concise and comprehensive mitigation plan that includes the following criteria:

- A detailed description of the project.
- A map, 1”=500’, that is consistent with the current vegetation maps in the application that clearly identifies the vegetation and the project area.
- Right of entry from the surface owners if other than ACD.
- A detailed description of the methodology and a time line for implementation.
- A seed mix, methodology for dispersal and rate of application.

- A description of the site restoration to prevent erosion.
  - Funding for mitigation.
- The application needs to include the location, acreages and a time line for removal of the junipers.
  - The applicant needs to include a timetable for importing Sage Grouse, the number of birds and the appropriate clearances from DWR, USFWS, BLM. [JH]

**R645-301-322, -301-333, -301-342, -301-358, Refer to Fish and Wildlife Resources Findings, p. 102 of the TA:** The following deficiencies pertain to Appendix 3-3, Sage-Grouse Distribution and habitat improvement Alton, Utah.

The Division requests an update on the status of the development of the alfalfa field.

- The applicant needs to describe in detail the application techniques that will be used in lieu of developing an alfalfa field for brood rearing habitat.
- The research on the plant insect relations needs to be completed and included in the application.
- The applicant needs to provide an update on the status of predator control arrangements and include a complete and adequate predator control plan, see comments under Protection and Enhancement.
- The applicant needs to provide an update on the status of juniper removal perhaps in terms of acres of restored habitat and a map delineating the restored areas.

**R645-301-322, -301-333, -301-342, and -301-358, Refer to Fish and Wildlife Resources Findings, p. 102 of the TA:** Restated from Task 2910. The following deficiencies pertain to Appendix 3- 5 Alton Sage-Grouse Habitat Mitigation Plan.

**1.) Minimize impacts to the birds from mining activities.** The application describes relocating the Sage Grouse birds to alternative sites (p. 12, App. 3-5, and App. 3-1, p. 3-43). This technique worked in 1978, but failed in 2008, indicating that this methodology needs improvement. The application needs to detail exactly how the applicant intends to improve the technique, based upon past experience. For example, the idea to include white markings on the decoys may not work, and is based on one or two anecdotal examples. Adding white might deter the birds. The application must include a simple experimental design to test the techniques before excavating the lek. This could be conducted on alternative populations, but also needs to be attempted on site, during the 2010 breeding season.

- The application needs to include a discussion of additional studies or examples where the experimental design has worked successfully or where it has been tried and failed, and a comparison of conditions between these studies and the Coal Hollow Mine.
- The mitigation plan needs to include the distances from the nearby alternative lek site to the existing lek or the mining activities. The Plan should also discuss or evaluate the habitat features of the new site and whether they are conducive to sage-grouse lekking.
- The plan needs to include a description of where the isolation berm is located in relation to the conservation

area, leks and mining areas and a discussion of how the proposed isolation berm may serve as a potential perch or hiding place for predators and become a threat to the Grouse. [JH]

**2.) Enhance current sage-grouse habitat.** The Plan needs to include a comparison of the Alton site to the site in the Bates, et al (2000) paper to determine if similar results be expected, or if there are substantial differences between the two sites (e.g., precipitation, climate, vegetation types) or would invasive species (e.g., cheatgrass) be of greater concern at the Alton site? • A brush bullhog rather than a tracked excavator and dump truck should be used to shred the trees leaving the shredded material on site. •The plan needs to include a commitment to conduct tree removal activities outside of the avian nesting season to avoid the take of eggs or young of other migratory birds. •The Plan contemplates mechanical sagebrush treatments in addition to removal of juniper, pine and Gambel oak. There is not enough information in the Plan (e.g., location of treatments, size of treatments, need for treatments, type of treatments, or current habitat condition) to adequately evaluate the need or potential success of sagebrush removal. The Sagebrush treatments need to be specifically targeted to the needs of the local sage-grouse population and to address the limiting factors in the sagebrush habitat. [JH]

**3) Create a conservation area for the sage-grouse that will never be mined.**

The Plan needs to specify the location, size or current condition of the area. The application needs to include a narrative that explains why this area was selected for protection. The Plan mentions several uses within the Conservation Area including roosting, breeding and nesting. In order to evaluate the success of the Conservation Area, the plan needs to include information that answers the following questions:

Is the area large enough to support all three uses?

What is the potential for diminishing the value of the area for roosting if the trees are removed?

Do sage-grouse already use the area and what impact tree clearing will have on the grouse?

How will grouse respond to the mining activities?

What is the distance of the Conservation Area from active mining activities. is not specified in the Plan, nor its relation to the new lek? [JH]

**4) Provide a corridor between north (Heut's Ranch) and south (Alton Sink Valley) populations to promote gene transfer and increase population numbers.** The plan needs to include mitigation measures to protect and improve the habitat quality near Heut's Ranch. [JH]

**5) Restore land disturbed by mining activities to enhance sage-grouse habitat.** Bareroot and containerized plants should be planted in addition to and

not in place of forb seed. •The application needs to include a plan for monitoring the Sage grouse population during the reclamation liability period. [JH]

**R645-301-352, -301-553, Refer to Contemporaneous Reclamation Findings, p. 152 of the TA:** Section 341.100 on page 3-44 states that "A detailed schedule and timetable for the completion of each major step in the mine plan has been included in Chapter 5 of the MRP." Chapter 5 includes a detailed description of each step in the surface mining process. However there are no schedules or timetables included in chapter 5 that are pertinent to contemporaneous reclamation. Chapter 5 needs to be revised to include a detailed schedule and timetable for each major step in the mine plan, including contemporaneous reclamation. [JH]

**R645-301-422, Refer to Air Pollution Control Plan Findings, p. 88 of the TA:** The Notice of Intent (App. 4-2) prepared by ACD to obtain an Air Quality permit states in Item 14 that the mine open mining area shall not exceed limits established by the DOGM. This is not acceptable, because DOGM does not evaluate the size of the open pit in relation to fugitive dust and because without an indication of the size of the open pit area, the DAQ can not accurately calculate fugitive dust emissions. Therefore, the NOI should describe the dimension of the open pit areas. [PB]

**R645-301-423.200, et seq, Refer to Air Pollution Control Plan Findings, p. 88 of the TA:** Restated from Task 2910, The regulatory applicability stated on page 1 of the fugitive dust control plan is not complete. The plan should cite the regulatory applicability of the Utah Coal Rules under which the plan was requested: R645-301-423 et seq ; R645-301-244 et seq; and R645-301-526.220 et seq. • The App. 4-5 monitoring program does not address the grading requirements of R645-301-244.300 for areas other than topsoil stockpiles. •The App. 4-5 plan for fugitive dust control practices addresses the requirements of R645-301-244.100 to protect (mulch) and stabilize (tackifier) exposed surface areas (topsoil and subsoil piles and regraded areas), however, the monitoring program does not include measurements of the effectiveness of mulching and tackifier applications to control fugitive dust and erosion from exposed surface areas. • The App. 4-5 monitoring program should specify what techniques will be used to determine opacity from a non-point source (the permit boundary). •App. 4-5 states that watering records will be maintained to show the dust control measures taken. However water applications alone are not sufficient data to evaluate the effectiveness of the fugitive dust control practices. Before and after opacity readings, wind speed and direction, should also be provided to allow an evaluation of the effectiveness of the watering applications. [PB]

**R645-301-514.100 and –514.120, Refer to Spoil and Waste Material, p. 115 of the**

**TA:** The Applicant must commit to regular inspections of lift thickness and compaction density during placement and compaction of fill materials. The Applicant must provide confirmation that compaction requirements meeting the minimum 85 % Proctor standard are being met as designated within the Taylor Geo-Tech slope stability analysis for spoil fill areas. •The inspection report must include a description of the test method that was used to determine that adequate compaction is being obtained as the fill is being placed. •The inspection report must include all other standard engineering test methods used to determine that a minimum long term static safety factor of 1.5 can and will be achieved. •The report must include any appearances of instability, structural weakness, and other hazardous conditions. [PH]

**R645-301.514.120, Refer to Road Systems and Other Transportation Facilities**

**Findings, p. 149 of the TA:** The application must state that copies of the spoil placement engineering inspection reports for the County road right-of-way and the Swapp Road will be provided to the Division. These inspection reports must document the Proctor compaction and other design requirements to be achieved for the reconstructed roads. The Division can then coordinate with Kane County and the Applicant regarding sub-grade adequacy for reconstruction of the County Road #136 and the Swapp Road in the mined out area.

**R645-301-521.141, Refer to Maps Plans Cross-Sections of Mining Operations p. 131**

**of the TA:** Restated from Task 2910, The Applicant must provide “*a detailed timetable for the completion of each major step in the reclamation plan*”. This requirement is relative to the initiation of final pit reclamation activities. [PH]

**R645-301-522, Refer to Coal Recovery Findings, p. 89 of the TA:**

The Applicant must justify why they do not intend to recover coal reserves between the highwall and the edge of the proposed permit boundary (by augering or other methods) in order to maximize coal recovery and effectively utilize the resource. [PH]

**R645-301-526.220, Refer to Mining Operations and Facilities Findings, p. 83 of the**

**TA:** Restated from Task 2910, The application must describe the effect of lighting the 24 hour operation on the night sky as seen from Bryce Canyon National Park and the Dixie National Forest. This issue was specifically raised in comments sent to the Division of Oil Gas and Mining by the public and from the District Ranger of the Dixie National Forest (2008/Incoming/0048.doc). [PHH, PB]

**R645-301-527.250 and R645-301-534.200, R645-301-512.250, Refer to Road Systems**

**and Other Transportation Facilities Findings, p. 148 of the TA:** Design and Reconstruction of Roads, The Applicant must provide a geotechnical analysis of the spoil materials associated with the Tropic Shale and alluvium for use as sub-



grade material as part of the re-construction design of all post mining roads within the coal recovery area. A Utah professionally certified civil engineer specializing in highway construction must perform the analysis for the two roads to be reconstructed on fill:

- 1) The Class "B" Kane County road #136 which must be capable of handling the heaviest vehicle weights.
- 2) The Swapp Ranch access road (shown in both reclamation scenario drawings, Dwg 5-35 and Dwg. 5-37 and having the same specifications as the Water Well Road (Dwg. 5-22 D).

The application must include the results of the geotechnical analysis and any resulting design standards for road construction required to make the sub-grade materials stable. If the Applicant cannot provide adequate geotechnical confirmation or achieve the design standards to ensure that all post-mining roads to be reconstructed on spoil will be stable, then the Applicant must consider other options. [PH]

**R645-301-535.100, Refer to Spoil and Waste Material, p. 116 of the TA:** This rule requires that the fill be designed. The Applicant must commit to meeting all of the recommended earthwork specifications contained in Appendix F for spoil fills and impoundment embankments. This can be done by reference to the Appendix in Chapter 5, Section 528.310. • Rather than stating that "excess spoil will be...concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction, " the Applicant must specify how the Professional Engineer will confirm that adequate compaction requirements (Proctor standard) will be met (i.e., by nuclear density examination, or other means) as part of the required periodic inspections mandated under R645-301-514.100, 514.311, and R645-301-514.120. [PH]

**R645-301-542.100 and R645-301-121.200, Refer to Backfilling and Grading Findings, p. 142 of the TA:** A timeframe for completing rough backfilling and grading is provided on p. 5-65 which states the following: "In both scenarios (Preferred and Alternate), rough backfilling and grading operations will follow coal removal by not more than 60 days or 1500 linear feet." Text on Page 5-66 states that "mined areas will be backfilled and graded within 180 days following coal removal, or 1500 feet of the active coal removal face." It appears that the information in the two aforementioned paragraphs conflicts. However, they may not conflict if the Applicant means to say that the backfilling and grading will be completed in 60 days of coal removal and ready for topsoiling and seeding within 180 days following coal removal. If the Division's interpretation of these two statements is accurate, please make the necessary corrections to the statement on p. 5-66. [PH]

**R645-301-542.100, Refer to Backfilling and Grading Findings, p. 143 of the TA:**

The Applicant will provide a timetable detailing when the rough backfilling and grading of Pits 2 and 3 will be initiated. This reclamation step will be initiated before coal recovery has been completed in Pit 6 (approximately 1500 feet from northern edge of Pit 2). •The application will describe how the Applicant will provide progress reports detailing when the rough backfilling and grading of Pits 2 and 3 will be initiated, and the continued submittal of those progress reports addressing rough backfilling and grading for the Phases 1, 2, and 3 coal recovery areas. The application will indicate reporting every 60 days, the following five items:

1. Coal recovery as it exists on a plan view map of the numbered pits.
2. The areas (coal recovery pits) where rough backfilling and grading has been completed.
3. The areas where coal recovery has been completed and contemporaneous rough backfilling and grading is occurring.
4. The areas where grading has been completed, and topsoil is being placed.
5. The areas where seeding using the Division approved reclamation seed mix has occurred. [PH]

**R645-301-542.600, Refer to Road Systems and Other Transportation Facilities**

**Findings, p. 148 of the TA:** Maps and narrative in the application must describe reconstruction of County Road 136 to its original alignment as requested by the County. The application must provide a drawing and specifications for Option A described in the Amended Grant of Easement and Assignment Amendment for County Road K3900 found in Appendix 1-7. •Drawing 5-22C illustrates the reclaimed road across Pugh property to the boundary with the USFS. This approximates the alignment of K3993 which was temporarily closed during mining. The Applicant must document this re-alignment and re-construction of K3993 with the County. [PHH]

**R645-301-553, Refer to Backfilling and Grading Findings, p. 143 of the TA:**

The Division can not support the variance from the 60 day/1,500 feet requirement for backfilling and grading based upon the supposition of acquiring the adjacent federal leases (which have not yet been made available). The variance request should be removed from the plan. The Division recommends that ACD apply for this variance ninety days before completion of coal recovery in Pit 24 and should include timely information relative to the procurement of any adjacent Federal coal leases. • The current plan shows recovery of coal from Pits 2 through 8 covering a north / south distance of 2200 feet, as well as an additional 750 feet on an east / west direction from Pits 9 – 12 (all coal recovery during Year 1). This plan is double the length allowed in R645-301-553. This plan is deficient. In accordance with the requirements of R645-301-553, Backfilling and Grading, the Applicant must revise the current plan for backfilling, grading, topsoiling and revegetating stated on Page 5-66 such that it meets the requirements of R645-301-553. The Division requires that Pit 4 rough backfilling and grading be completed before overburden removal is initiated in Pit 9. Pits 1, 5, 6 and 7 must be

completed (rough backfilling and grading) before mining in Pit 13 is initiated.

**R645-301-624, -724, Refer to Hydrology Resources Findings, p. 71 of the TA:**

Restated deficiency from Task 2910. The Applicant needs to show the extent and depth of the proposed pits on the geologic cross sections of Drawings 6-3, 6-7, and 6-8. Also, to more clearly convey the importance of the Sink Valley Fault and associated Tropic Shale ridge in the relationship of the hydrologic systems to the proposed mine, the Applicant needs to show the Sink Valley Fault on several other maps and cross sections, including but not limited to: Drawings 7-1, 7-4, 7-7, 7-12, 5-10, 5-17, 5-18, and 5-19. As an alternative, the Applicant could create new maps and cross sections that clearly show the extent of the pits – including the extent of overburden removal (Drawing 5-16); the location of the fault and Tropic Shale Ridge (Drawing 7-12); the location of seeps and springs (Drawing 7-1); the potentiometric surface (Figure 13 and Drawing 7-13); the Alluvial Discharge Areas (Drawing 7-4); and – if known - location, extent, thickness or top-elevation of the saturated zone(s) of the alluvial aquifer. Such maps and cross section don't need to cover the entire permit area; larger scale maps and cross sections, centered on Pit 15 where the possibility of impacting the hydrologic balance and the essential hydrologic function of the possible AVF is greatest, would be preferable. Cross sections should be approximately 1000 feet apart and must extend beyond the Permit Boundary far enough to show the relationship of the proposed mining to hydrology of the adjacent area; all cross sections should extend east far enough to include the Sink Valley Wash channel. [JS]

**R645-301-720, Refer to Hydrology Resources Findings, p. 72 of the TA:** Restated from Task 2910. All water rights that have a potential to be impacted by mining will be monitored. Water rights need to be submitted in a table that identifies all of the following information: the water right, the sampling site number, the type of water right (domestic, irrigation, stockwatering), the amount of the water right, recorded flow, ownership and status. [DWD]

**R645-301-720 and -121.200, Refer to Hydrology Resources Findings, p. 72 of the TA:** In the following statement on page 18 of Appendix 7-7, the Applicant needs to clearly identify the Section and quarter-section where the trenches in T. 39 S., R. 5 W. were dug, "...Shallow alluvial groundwaters were sampled from trenches in the alluvial system in the eastern 1/4 of Section [?] T39S, R5W in April 2006," [JS]• **Refer to Maps Plans and Cross Sections of Resource Information Findings, p. 80 of the TA:** Spring locations on Drawings 7-1, 7-2, and 7-10 do not match those on Drawing 7-3. The Applicant must resolve this confusion. [JS]

**R645-301-722 and 512.110, -512.140, -512.150, Refer to Maps Plans and Cross Sections of Resource Information Findings, p. 80 of the TA:** The Application needs a single map that shows the extent of the pits – including the extent of overburden removal (Drawing 5-16), the location of the fault and Tropic Shale Ridge (Drawing 7-12), the location of the seeps and springs (Drawing 7-1), and

the Alluvial Discharge Areas (Drawing 7-4). This drawing doesn't need to show the entire permit area, but rather should center on Pit 15, where these features are proximate to each other and the possibility of impacting the hydrologic balance and the essential hydrologic function of the potential AVF is greatest. [JDS]

**R645-301-722.100 and -121.200, Refer to Maps Plans and Cross Sections of Resource Information Findings, p. 81 of the TA:** Section 722.100 contains the statements that, "...It is important to note that the alluvial ground-water potentiometric contours depicted in Drawing 7-2 are not representative of a laterally or vertically continuous ground-water system..." Drawing 7-2 does not contain potentiometric data; Drawing 7-13 and Figure 13 of Appendix 7-7 contain this information; however, Drawing 7-13 has contours but no potentiometric data values, while Figure 13 has potentiometric data values but no contours. Both data and contours need to be shown on the same map.

- The Applicant needs to add contour lines to Figure 13 of Appendix 7-7 and
- Potentiometric data to Drawing 7-13.
- The erroneous references to Drawing 7-2 need to be corrected. [JDS]

**R645-301-722.100, Refer to Maps Plans and Cross Sections of Resource Information Findings, p. 81 of the TA:** Restated from Task 2910, Drawing 14 of Appendix 7-7 shows the seasonal variation of head during 2007, but the values have not been contoured. •The Applicant needs to add contour lines to Figure 14 of Appendix 7-7. Also, although the numbers imply the water levels rose between June and December, the Applicant needs to clarify this. [JDS]

**R645-301-722.300, Refer to Hydrology Resources Findings, p. 72 of the TA:** Restated deficiency from Task 2910. The Applicant needs to clarify the difference between the wells shown on Drawing 7-2 and those on Drawing 7-12. It still isn't clear why the wells on Drawing 7-12 and on Figure 12 of Appendix 7-1 are not included in the baseline monitoring points shown on Drawing 7-2. Drawing 7-2 shows spring, stream, and well baseline monitoring location; however, Drawing 7-12 shows additional wells used to gather baseline data, and most of them were installed by the Applicant for this permit application. The excerpts from the Application below need clarification:

"722.300 Baseline monitoring stations

Baseline monitoring stations are shown on Drawing 7- 2. A map showing the locations of monitoring wells in the proposed Coal Hollow permit and adjacent area is presented in Drawing 7-12 and on Figure 12 of Appendix 7-1. Drawings 7-2 and 7-12 also show monitoring stations from which baseline hydrologic data were collected in previous studies. Monitoring station locations, elevations, and other details are presented in Table 7-1."

"724.100 Groundwater Information

“The location of wells and springs in the proposed Coal Hollow Mine permit and adjacent area are shown on Drawings 7-1 (Spring and seep survey map), 7-2 (Baseline monitoring locations), and 7-12 (Monitoring well location map)...”[JS]

**R645-301-724.100, Refer to Hydrology Resources Findings, p. 72 of the TA:** Restated deficiency from Task 2910. The applicant needs to consolidate well information so it is more readily accessed. The applicant should develop **a single table** to show **all** wells which are in the database, show which wells are monitored, which ones have water rights, ownership, collar elevation, ground elevation, depth to water from ground, elevation of water, which map they are located on and how they are monitored (for field and quality parameters, field parameters, elevation only). The applicant stated; a new well information summary table (Table 10) was submitted with the new permit application. Table 10 could not be found. • The applicant needs to consolidate spring information so it is more readily accessed. The applicant should develop a table to show **all springs**, which ones are monitored, which ones have water rights, ownership, flow range, which map they are located on and how they are monitored (for field and quality parameters, field parameters, flow only). The applicant mentioned the spring information summary table (Table 11) was submitted with the new permit application. Table 11 could not be found. • The applicant will need to show the seasonal variation of ground water on a map for the entire permit area and adjacent area. During the last review the Applicant was asked to show the seasonal variation of ground water on a map for the entire permit area and adjacent area. The applicant provided Figures 13 showing the average depths to groundwater relative to surface in the alluvial groundwater system in the proposed and adjacent permit area during 2007. Wells Y-102, Y-61 and Y-59 and C-5 showed artesian flow. Figure 14 is presented to show the seasonal variation in groundwater levels in the alluvial system during 2007. It is assumed that the values in Figure 14 represent the total change, but it is not the information the Division was requesting. The applicant needs to provide the seasonal variation as isohyatal lines for quarterly changes, as monitored represented by isopiestic lines. [DWD]

**R645-301-724.200 and - 121.200, Refer to Hydrology Resources Findings, p. 73 of the TA:** Deficiency restated from Task 2910,

- The surface-water baseline discrepancies between Section 724.200, Drawing 7-2, Table 7-5, and the Division’s database, as outlined in the following table, still need to be resolved. BLM-1 is on Drawing 7-10, but the Applicant needs to include it on Drawing 7-2, which shows baseline monitoring points.

<b>Baseline Monitoring Sites</b>	<b>Described in Section 724.200</b>	<b>Listed in Table 7-5</b>	<b>Shown on Drawing 7-2</b>	<b>Data in Database</b>
SW-1	√		√	√
SW-7	√		√	√

SW-10			√	√
BLM-1		√	(Drawing 7-10)	√
Lamb Canal			√	√

- The Applicant stated in the cover letter for the December 2008 submittal that "Surface-water baseline monitoring sites SW-I0, BLM-1, and Lamb Canal were added to the description in Section 724.200", but no such information has been added to that section of the application. The Applicant must clarify this.[JS]

**R645-301-724.500, Refer to Hydrology Resources Findings, p. 74 of the TA:**

Deficiency restated from Task 2910. The Applicant needs to provide a map – or set of maps – illustrating the size and shape of the cone of depression from the pump-drawdown test at Y-61. •Figure 18 in Appendix 7-1 indicates that during the pump test, water levels actually increased at SP-8 and SS-30, and flow increased at C2-40 after 4 hours of pumping; the Application should include a discussion of these increases. [JS]

**R645-301-727, Refer to Hydrology Resources Findings, p. 74 of the TA:** Restated from deficiency Task 2910. Sections 728.310, (*Draining of up-gradient groundwater resources*, p. 7-29) and 728.334 (p. 7-44) still refer to Y-61 as a water production well: the Applicant needs to clarify the proposed purpose of Y-61. [JS]

**R645-301-728, Refer to Hydrology Resources Findings, p. 74 of the TA:**The stream laid deposits in Sink Valley will not be mined, however some of the ground water in the Sink Valley alluvium comes from the adjacent colluvial sediments. Groundwater flow to and through alluvial sediments in the potential AVF should be determined. [DWD]

**R645-301-728 and –121.200, Refer to Hydrology Resources Findings, p. 74 of the TA:** Sections 724.500 and 728.310, p. 7-31 state that backfilling and individual mine pits will remain open for no more than 60 to 120 days, but it is not clear whether this timeframe is 60 – 120 days post mining or whether the timeframe includes both mining and reclamation. The Application should be more specific in Sections 724.500 and 728.310 concerning the length of time that a pit may remain open during coal recovery through completion of backfilling. [PB, JS]

**R645-301-728.310, Refer to Hydrology Resources Findings, p. 74 of the TA:** Restated deficiency from Task 2910. The Applicant shall supply a series of cross-sections that depict the relationship between the mine pit and Sink Valley trough, and show the expected change in the groundwater head as a result of mining. The detailed cross sections should illustrate the depth and distance (length) of open pit face that potentially intercepts the groundwater regime in Sink Valley. Cross sections should be projected through the permit area and Sink Valley every 1,000 feet, or through the mine pits. All cross sections should show the expected levels



where mining will intercept Sink Valley and be depicted accurately on a horizontal and vertical scale. Cross-sections should depict the change in groundwater from east to west. Cross-sections should also be generated from data to show the change in groundwater from north to south. (The Division recognizes that the changes in groundwater interception will be dynamic as pits are opened and closed.) The Applicant submitted one cross-section in Drawing 7-6 showing the mine workings in Pit 15. The drawing shows the interception of the alluvial basin in Sink Valley, but does not show the draw down of groundwater during mining and the recovery after mining. An aerial view projecting groundwater draw down and recovery should also be presented. •The Applicant should discuss how the pit will be reclaimed to restore the pre-existing groundwater level in Sink Valley. [DWD]

**R645-301-728.334, Refer to Hydrology Resources Findings, p. 75 of the TA: Under Direct Interception of Groundwater Resources, the Applicant states that:**

“Alluvial groundwater systems in planned mining areas in the proposed Coal Hollow Mine permit area will be directly intercepted by the mine openings. It is not anticipated that the direct interception of shallow alluvial groundwater will adversely impact the overall hydrologic balance in the region. This is because no springs, seeps or other important groundwater resources have been identified in proposed mine pit areas (Drawing 7-1 [and Dwg. 5-2]). In the pre-mining condition, any diffuse groundwater discharge to the ground surface that occurs is primarily lost to evapotranspiration and does not contribute appreciably to the overall hydrologic balance in the area.”

This addresses ground water that supplies springs and seeps but seems to ignore the importance of subirrigation to what is possibly an adjacent AVF and dismisses the impact that direct interception of ground water in the alluvial aquifer would have on the moisture held in the soils and subsurface flow and other components of the essential hydrologic function of the potential AVF. The Applicant needs to address the possible impacts of interception of the alluvial aquifer on subirrigation and soil moisture in the adjacent, potential AVF. [JS]

**R645-301-731.100 and R645-301-731.200, Refer to Hydrology Operations Findings, p. 75 of the TA: The Applicant shall provide seasonal baseline water monitoring information for all water rights that could be affected by mining in the permit and adjacent area. [DWD]**

**R645-301-731.121 and R645-301-751, Refer to Support Facility and Utility Installations Findings, p.127 of the TA: The Applicant must develop and P.E. certify a spill prevention and counter measure plan for the bulk storage facilities which are to be built as part of the Alton Coal Development Coal Hollow Mine**

surface facilities. The MRP must include information stating how the surface facilities will be operated in order to meet the performance standards of R645-301-750.

**R645-301-731.214, Refer to Hydrologic Information Findings, p. 151 of the TA:**

Hydrologic monitoring during reclamation can be assumed to be the same as during mine operation, but the Applicant needs to clarify the reclamation water monitoring plan.[JS]

**R645-301-731.300, Refer to Hydrologic Information Findings, p.125 of the TA:**

Appendix 6-2 shows unacceptable levels of selenium in the zone below the coal and in the vicinity of CH-06-05, below 35 ft. where either insufficient sample provides no information on selenium levels or high levels of selenium were recorded. To ensure that selenium levels are adequately represented by these six core holes and that selenium levels in the surface and in the submerged water table remain low, the Division will require a selenium monitoring plan for soils and overburden during final placement. Refer to Attachment 1 of the Division's 2008 Guidelines for Topsoil and Overburden Handling when writing the Coal Hollow selenium monitoring plan. **and R645-301-121.200, Refer to Hydrology Operations Findings, p. 125 of the TA:** The Applicant states in Section 728.332 that Wyoming considers a value of 0.3 mg/kg selenium as suitable and between 0.3 and 0.8 mg/kg selenium as marginally suitable for topsoil and topsoil substitute. This statement is inaccurate and must be corrected. Refer to Acid/Toxic discussion above. [PB]

**R645-301-731.530, Refer to Hydrologic Information Findings, p. 126 of the TA:** It is not clear if the water replacement well will also be the water-supply for the mine or for water-replacement only. If the latter, the Applicant needs to commit to have the water-replacement well drilled and developed before beginning overburden removal for Pits 13, 14, and 15. [JDS]

**R645-301-731.800, Refer to Hydrologic Information Findings, p. 125 of the TA:**

Restated deficiency from Task 2910. The Applicant must provide reclamation designs for the eastern permit boundary where the mining pits meet the undisturbed alluvium. Such designs will specify engineering methods to be used to minimize drainage from the alluvium into the fill in the reclaimed pits (as the pits are filled and reclaimed) thereby protecting the hydrologic balance in Sink Valley. In the cover letter for the December 2008 submittal, the Applicant states that this has been addressed, but the information could not be found in Chapters 5 or 7.[JDS] The Applicant should discuss how the pit will be reclaimed to restore the groundwater level in Sink Valley. [JS, DD]

**R645-301-742.313 and -553.110, Refer to Hydrology Resources Findings, p. 75 of the TA:** As currently proposed, the plan calls for the temporary diversion of a reach of the Lower Robinson Creek stream channel in the southeast 1/4 of Section 19,

T. 39 S., R. 5 W. Details of the proposed diversion are given in Chapter 5, Section 527.220 of the MRP. Statements on pp. 7-19, 7-28, 7-46, and 7-57 in the MRP refer to this as a permanent diversion; the Applicant needs to remove these statements or correct them to indicate that this will be a temporary diversion.[JS]

**R645-301-745.120, Refer to Hydrologic Information Findings, p. 151 of the TA:** The Application must provide detailed cross sections showing the amount of open face that potentially intercepts ground water from Sink Valley. (see also deficiency written under R645-301-728.310). [DD]

**R645-301-830.140, Refer to Bonding and Insurance Findings, p. 162 of the TA:** The Division needs the Stage 1, 2 and 3 costs broken out such that incremental bonds may be implemented for the coal mining area in accordance with the requirements of **R645-301-820.111, 820.112 through 820.133**, and in agreement with Alton Coal Development. Alton Coal Development must provide a detailed cost estimate, with supporting calculations for the following Coal Hollow areas:

- 1) Demolition of the Facilities and Structures / Loadout as shown on Drawing 5-4.
- 2) Reclamation costs for ponds 2 and 3, including backfilling and grading, re-soiling and re-vegetating.
- 3) Reconstruction of Robinson Creek
- 4) Total Reclamation Costs for Stage 1, to include backfilling and grading, topsoiling and re-vegetation of the 69 acres associated with the mining area.
- 5) Total Reclamation Costs for Stage 2, to include backfilling and grading, topsoiling and re-vegetation of the 68 acres.
- 6) Total Reclamation Costs for Stage 3, to include backfilling and grading, topsoiling and re-vegetation of the 99 acres.
- 7) These total costs must include reclamation costs for the final (or Stage 3 remaining pit) pit area depicted on Drawing 5-19.
- 8) Total Reclamation Costs for the Stage 1 excess spoil reclamation. [PH]

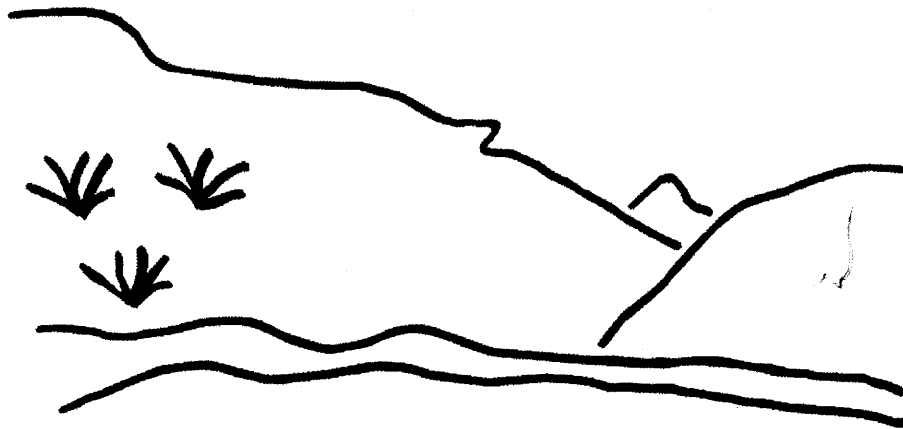
**R645-302-320, Refer to Alluvial Valley Floor Findings, p. 47 of the TA:** Information in the MRP indicates that there are stream laid deposits in the area of the stream channel in Sink Valley, below Swapp Hollow (the center of the SW ¼, Sec 29), east of the permit area, which are important to agriculture. The applicant will have to show that the proposed operations will not interrupt, discontinue or preclude farming on this potential alluvial valley floor in the adjacent area, and

that the groundwater system in Sink Valley can be restored. The Applicant was directed to show cross-sections on 1000 ft. intervals as to how the mine would intercept the Sink Valley trough, see deficiency R645-301-624, -724 and R645-301-728.100 in the Environmental Resource/Hydrology section of this Technical Analysis. [DWD]

**R645-302-321.100, Refer to Alluvial Valley Floor Findings, p. 48 of the TA:** The Applicant should provide an indication of where the deep aquifer water intercepted by well SS-75 daylights downstream in lower Sink Valley. [PB]

**R645-302-321.260, Refer to Alluvial Valley Floor Findings, p. 48 of the TA:** Section 6.4 states that “the topographic characteristics of most lands within the project area are compatible with flood irrigation techniques”. Available water rights and historical irrigation indicate flood irrigation is important to agricultural use. The application needs to include a mitigation plan for restoring water to these areas. [JH] • Plates 3 and 4 include color infrared aerial imagery taken in July of 2006 and November of 2007. Moist areas in Plate 3 appear to be grey and moist areas in Plate 4 appear to be red. To enable a comparison between plates, the presentation of these two plates should be equivalent (developed with the same exposure time), such that moist areas are the same color on both plates. [PB] • Restated from Task 2910, During the site visit on October 2, 2008, Dr. Collins and Joe Helfrich discussed the requirements of R645-302-321.260 and concluded that “an analysis of a series of aerial photographs including infrared imagery flown at a time of year to show any summer and fall differences between upland and valley floor vegetation” had been completed by the applicant (personal conversation with Patrick Collins, 10/2/2008). Although it was not specifically stated during the discussion in the field, the Division came away with the understanding that the results and conclusions of the analysis were readily available in the application and therefore the information in the application partially met the requirements of this section of the regulations. However, a discussion of the results and specific conclusions from the comparative analysis of the color infrared aerial imagery, plates 3 and 4 still needs to be included in section 7.1 page 31 of Appendix 7-7. Although the Applicant utilized the aerial photos in their analysis, a discussion of the results and specific conclusions from the comparative analysis of the color infrared aerial imagery, Plates 3 and 4 still needs to be included in section 7.1 page 31 of Appendix 7-7. (repeated request from Task 2910) [JH]

# State of Utah



## Utah Oil Gas and Mining

### Coal Regulatory Program

Coal Hollow  
C/025/0005  
Alton Coal Development, LLC  
Technical Analysis  
March 26, 2009

## TABLE OF CONTENTS

---

<b>TECHNICAL ANALYSIS DESCRIPTION .....</b>	<b>1</b>
<b>GENERAL CONTENTS.....</b>	<b>2</b>
IDENTIFICATION OF INTERESTS .....	2
VIOLATION INFORMATION .....	3
RIGHT OF ENTRY .....	3
LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS.....	4
PERMIT TERM.....	10
PUBLIC NOTICE AND COMMENT .....	10
FILING FEE .....	12
PERMIT APPLICATION FORMAT AND CONTENTS .....	12
REPORTING OF TECHNICAL DATA .....	12
MAPS AND PLANS .....	13
COMPLETENESS .....	14
<b>ENVIRONMENTAL RESOURCE INFORMATION.....</b>	<b>15</b>
GENERAL.....	15
PERMIT AREA.....	15
HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION .....	16
CLIMATOLOGICAL RESOURCE INFORMATION.....	24
VEGETATION RESOURCE INFORMATION.....	25
FISH AND WILDLIFE RESOURCE INFORMATION .....	26
SOILS RESOURCE INFORMATION .....	27
LAND-USE RESOURCE INFORMATION .....	28
ALLUVIAL VALLEY FLOORS.....	29
<b>Alluvial Valley Floor Determination.....</b>	<b>29</b>
PRIME FARMLAND.....	49
GEOLOGIC RESOURCE INFORMATION .....	50
HYDROLOGIC RESOURCE INFORMATION .....	51
<b>Sampling and Analysis .....</b>	<b>52</b>
<b>Baseline Information .....</b>	<b>52</b>
<b>Baseline Cumulative Impact Area Information.....</b>	<b>60</b>
<b>Probable Hydrologic Consequences Determination.....</b>	<b>60</b>
<b>Surface-Water Monitoring Plan.....</b>	<b>70</b>
<b>MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION .....</b>	<b>76</b>
<b>Affected Area Boundary Maps.....</b>	<b>76</b>
<b>Existing Structures and Facilities Maps .....</b>	<b>77</b>
<b>Existing Surface Configuration Maps .....</b>	<b>77</b>
<b>Mine Workings Maps .....</b>	<b>77</b>
<b>Permit Area Boundary Maps .....</b>	<b>78</b>
<b>Surface and Subsurface Manmade Features Maps.....</b>	<b>78</b>
<b>Drawing 7-7 is P.E. certified by a Utah registered professional engineer.....</b>	<b>78</b>
<b>Surface and Subsurface Ownership Maps .....</b>	<b>78</b>
<b>Subsurface Water Resource Maps .....</b>	<b>79</b>
<b>Surface Water Resource Maps .....</b>	<b>79</b>
<b>Archeological Site Maps.....</b>	<b>80</b>



## TABLE OF CONTENTS

Cultural Resource Maps .....	80
Monitoring and Sampling Location Maps .....	80
Permit Area Boundary Maps .....	80
Vegetation Reference Area Maps .....	80
Affected Area Boundary Maps .....	80
<b>OPERATION PLAN .....</b>	<b>82</b>
MINING OPERATIONS AND FACILITIES .....	82
EXISTING STRUCTURES: .....	83
PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES .....	84
RELOCATION OR USE OF PUBLIC ROADS .....	84
AIR POLLUTION CONTROL PLAN .....	86
COAL RECOVERY .....	88
SUBSIDENCE CONTROL PLAN .....	89
SLIDES AND OTHER DAMAGE .....	90
FISH AND WILDLIFE INFORMATION .....	90
<b>Protection and Enhancement Plan .....</b>	<b>90</b>
<b>Endangered and Threatened Species .....</b>	<b>99</b>
<b>Bald and Golden Eagles .....</b>	<b>99</b>
<b>Wetlands and Habitats of Unusually High Value for Fish and Wildlife .....</b>	<b>99</b>
TOPSOIL AND SUBSOIL .....	104
Topsoil Removal and Storage .....	104
VEGETATION .....	106
ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES .....	107
Road Classification System .....	107
Plans and Drawings .....	107
Performance Standards .....	109
Primary Road Certification .....	110
Other Transportation Facilities .....	111
SPOIL AND WASTE MATERIALS .....	111
Disposal Of Noncoal Mine Wastes .....	111
Coal Mine Waste .....	111
Refuse Piles .....	112
Impounding Structures .....	112
Coal Processing Waste Dams and Embankments .....	112
Burning And Burned Waste Utilization .....	112
Return of Coal Processing Waste to Abandoned Underground Workings .....	112
Excess Spoil: .....	112
MINE OPENINGS .....	116
HYDROLOGIC INFORMATION .....	116
General .....	117
Groundwater Monitoring .....	118
Springs .....	118
Wells .....	119
Surface Water Monitoring .....	119

## TABLE OF CONTENTS

---

Acid- and Toxic-Forming Materials and Underground Development Waste .....	119
Transfer of Wells .....	120
Discharges Into An Underground Mine .....	120
Gravity Discharges From Underground Mines .....	121
Water-Quality Standards And Effluent Limitations.....	121
Diversions: General .....	121
Diversions: Perennial and Intermittent Streams .....	121
Diversions: Miscellaneous Flows .....	121
Stream Buffer Zones.....	121
Sediment Control Measures.....	122
Siltation Structures: General.....	122
Siltation Structures: Sedimentation Ponds .....	122
Siltation Structures: Other Treatment Facilities.....	123
Siltation Structures: Exemptions .....	123
Discharge Structures .....	123
Impoundments .....	123
Ponds, Impoundments, Banks, Dams, and Embankments .....	124
SUPPORT FACILITIES AND UTILITY INSTALLATIONS.....	126
USE OF EXPLOSIVES.....	128
General Requirements.....	128
Preblasting Survey .....	128
Blasting Signs, Warnings, And Access Control .....	129
Control of Adverse Effects .....	129
Records of Blasting Operations.....	130
MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS .....	130
Mining Facilities Maps .....	131
Mine Workings Maps .....	131
Certification Requirements.....	131
RECLAMATION PLAN.....	132
GENERAL REQUIREMENTS.....	132
POSTMINING LAND USES.....	132
PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES .....	133
APPROXIMATE ORIGINAL CONTOUR RESTORATION .....	134
BACKFILLING AND GRADING.....	135
General.....	135
Previously Mined Areas .....	141
Backfilling and Grading On Steep Slopes .....	142
Special Provisions for Steep Slope Mining .....	142
MINE OPENINGS .....	143
TOPSOIL AND SUBSOIL.....	145
Redistribution .....	145
ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES .....	146
Reclamation.....	146
Retention.....	146

## TABLE OF CONTENTS

---

HYDROLOGIC INFORMATION.....	149
<b>Hydrologic Reclamation Plan</b> .....	149
CONTEMPORANEOUS RECLAMATION .....	151
<b>General</b> .....	151
REVEGETATION.....	152
<b>Revegetation: General Requirements</b> .....	152
<b>Revegetation: Timing</b> .....	153
<b>Revegetation: Mulching and Other Soil Stabilizing Practices</b> .....	153
<b>Revegetation: Standards For Success</b> .....	154
STABILIZATION OF SURFACE AREAS.....	154
CESSATION OF OPERATIONS .....	156
MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS .....	156
<b>Affected Area Boundary Maps</b> .....	157
<b>Bonded Area Map</b> .....	157
<b>Reclamation Backfilling And Grading Maps</b> .....	158
<b>Reclamation Facilities Maps</b> .....	158
<b>Final Surface Configuration Maps</b> .....	159
<b>Reclamation Monitoring And Sampling Location Maps</b> .....	159
<b>Reclamation Surface And Subsurface Manmade Features Maps</b> .....	159
<b>Reclamation Treatments Maps</b> .....	159
<b>Certification Requirements</b> .....	160
BONDING AND INSURANCE REQUIREMENTS .....	160
<b>General</b> .....	160
<b>Form of Bond</b> .....	160
<b>Determination of Bond Amount</b> .....	161
REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING .....	163
INTRODUCTION .....	163
OPERATIONS IN ALLUVIAL VALLEY FLOORS.....	163
CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA).....	164

## TECHNICAL ANALYSIS DESCRIPTION

The Division ensures that coal mining and reclamation operations in the State of Utah are consistent with the Coal Mining Reclamation Act of 1979 (Utah Code Annotated 40-10) and the Surface Mining Control and Reclamation Act of 1977 (Public Law 95-87). The Utah R645 Coal Mining Rules are the procedures to implement the Act. The Division reviews each permit or application for permit change, renewal, transfer, assignment, or sale of permit right for conformance to the R645-Coal Mining Rules. The Applicant/Permittee must comply with all the minimum regulatory requirements as established by the R645 Coal Mining Rules.

The regulatory requirements for obtaining a Utah Coal Mining Permit are included in the section headings of the Technical Analysis (TA) for reference. A complete and current copy of the coal rules can be found at <http://ogm.utah.gov>

The TA is organized into section headings following the organization of the R645-Coal Mining Rules. The Division analyzes each section and writes findings to indicate whether or not the application is in compliance with the requirements of that section of the R645-Coal Mining Rules.

## GENERAL CONTENTS

### IDENTIFICATION OF INTERESTS

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

#### Analysis:

In Chapter 1, Section 112, the applicant has met the requirements to provide ownership and control information for the operation and surface lands affected. The applicant and operator is Alton Coal Development, LLC, a limited liability company. The company is registered with the Utah Department of Commerce (Confidential Binder, Appendix 1-1). The corporate office is in Cedar City. The telephone and address is provided. The list of company officers' names and addresses and percent ownership, and the employer identification number have been provided. Chris McCourt is the resident agent and manager. Robert C. Nead, Jr., has been designated as the person responsible for paying the abandoned mine land reclamation fee (Section 112.230).

Surface and coal ownership are displayed on Dwg. 1-3 and 1-4, respectively and described in Section 112.500. The permit area surface is owned by two parties: C. Burton Pugh and the Allecia Swapp Dame Trust, administered by Richard Dame, Trustee. (Contact information for the surface owners have been provided.) Surface lands have been leased to the applicant. The lease assignments are included in the Confidential binder, Appendix 1-2.

Section 112.500 also provides the name and addresses of the owners of the coal to be mined. All 435 acres of coal to be mined is privately held, and has been leased by Alton Coal. The leases are provided in the Confidential binder, Appendix 1-2. There are 200 acres of coal owned by the Bureau of Land Management (BLM) in the north portion of the permit area shown on Dwg. 1-4, but this coal will not be mined.

Adjacent surface and subsurface ownership is displayed on Dwg. 1-3 and 1-4. As stated in Section 112.600, the BLM and Darlynn and Arlene Sorensen own land contiguous to the permit area.

Interest in adjacent federal coal is outlined in Section 112.800. The applicant has filed a lease by application with the BLM. At this time, the BLM is writing an Environmental Impact Statement. The BLM has determined the size of the Alton Coal Tract LBA to be approximately 3,600 acres (BLM Open House, Salt Lake City, February 2007).

The MSHA number for the mine site is 42-02519 (Section 112.700) MSHA numbers for structures are pending.

---

GENERAL CONTENTS

---

**Findings:**

The information provided meets the requirements of the Regulations for Identification of Interest

**VIOLATION INFORMATION**

Regulatory Reference: 30 CFR 773.15(b); 30 CFR 773.23; 30 CFR 778.14; R645-300-132; R645-301-113

**Analysis:**

Section 113 of the application states that there are no violations, suspensions, revocations, or forfeitures on record for Alton Coal Resources, LLC., or its officers or affiliates. An Applicant Violator System check indicated that the company has not operated previously in the United States and that two of the officers have been previously engaged in coal mining operations. No violations were retrieved from the system on March 13, 2008.

**Findings:**

The applicant has met the requirements of the Rules for Violation Information.

**RIGHT OF ENTRY**

Regulatory Reference: 30 CFR 778.15; R645-301-114

**Analysis:**

The applicant has right of entry to 794.74 acres in T. 39 S., R. 5 W. Salt Lake Meridian, Sections 19, 20, 29, and 30. The application states that right of entry was obtained through lease agreement with the surface and mineral lease owners (Section 114). These agreements are found in the Confidential Binder, Appendix 1-2. Fee coal beneath Pugh surface is held by several individuals: C. Burton Pugh.. 40.5% of the coal; Margaret Moyers, 22.5%, and Roger Pugh, 37% (according to p. 32 of the Roger Pugh lease document). (Roger Pugh inherited the coal ownership from Verna Pugh who is deceased (personal communication from Chris McCourt on February 18, 2009).

Specific surface lands are described in the C. Burton Pugh lease document, which encompasses 732.78 acres (App. 1-2, Ex. 1), which includes land east of the permit area. Interest in the subsurface east of the permit area was declared in Section 112. 800. The Moyers and R. Pugh lease documents encompasses 372.68 subsurface acres of coal within the permit area, as shown by Dwg 1-4.



Exhibit 2 of Appendix 1-2 is the Dame Trust lease, which was signed by the Trustee, Richard Dame, on April 29, 2005. Specific lands are described in the Dame lease document, encompassing 61.96 acres.

**Findings:**

The information provided meets the requirements of the Regulations for Right of Entry.

**LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS**

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

**Analysis:**

Section R645-103 establishes procedures for designating lands unsuitable for all or certain types of coal mining and reclamation operations on state and private lands. The authority to make determinations of unsuitability on federal lands is reserved to the Secretary of Interior. The rules contain two general categories of designation (1) statutory designations and (2) designations by petition.

Statutory designations are described in R645-103-200 and require the Division, upon receipt of a complete permit to determine whether a proposed coal mining and reclamation operation can be authorized in light of the mandatory prohibitions set forth in the Act at §40-10-24(4). These prohibitions include:

- Lands prohibited under public law examples include National Parks, National Forests, Refuges, National Trail Systems, Wilderness, and Scenic Rivers;
- On any lands which will adversely affect public parks or places on the National Register of Historic Sites (with exceptions);
- Within 100 feet of or relocation of a public road, (with exceptions); and
- Within 300 feet of an occupied dwelling, school, church, or public building, (with exceptions).

The general rules for both designations (statutory and petition) require the Division to integrate as closely as possible suitability decisions with present and future land use planning and regulatory processes at the state and local levels.

This review does not analyze designations by petitions to designate lands unsuitable because the Division has not received a petition.

**Land Use Planning at the State and Local Levels**

GENERAL CONTENTS

---

Almost 88 percent of the Kane County land base is in federal ownership. The Utah State Institutional and Trust Lands Administration control an additional 8 percent leaving 4 percent of the land in private ownership. Thus any planning on federal or state lands greatly impacts Kane County. The State of Utah develops resource plans on a state level but generally recognizes the local county and municipal governments as having land use planning authority. While the Coal Hollow Coal Mine is all on private property, State policy (§63J-4-401(6)(a)) on federal lands is to:

- Promote multiple use;
- Achieve a high level of mineral output; and
- Support mineral development at the highest reasonably sustainable level.

State code (§63J-4-401(8)(m)) further specifies that on federal lands state policy is that:

- Mineral and energy production and environmental protection are not mutually exclusive;
- It is technically feasible to permit appropriate access to mineral and energy resources while preserving other resources; and
- Development of the solid mineral resources of the state should be encouraged.

The document Kane County Utah General Plan for the Physical Development of the Unincorporated Area Pursuant to Section 17-27-301 of the Utah Code, (Adopted June 1998 and written by Five County Association of Governments) recognizes the presence of extensive mineral deposits and a potential resource for future generations. The plans focus on federal lands because:

"Privately owned land is adjacent to federal and state lands. Management decisions for the federal and state lands directly impact use of, and the economic value of, private land."

One of the stated purpose and intent of public lands policy for energy and mineral resources is:

"The mining industry makes up an important part of the property tax base of the County, and its payroll and expenditures for supplies are important to the economic stability of the County. Mining is one of the historic multiple uses on federally managed land and maintenance of the use is compatible with the multiple use principle."

According to the Kane County Planning and Zoning Map the area within the proposed permit area (T39S, R5W sections 19, 20, 29, and 30) is zoned for Agriculture (AG) and Residential Recreation (REC-R36). The Kane County Land Use Ordinance, July 1, 1998, Revised November 11, 2006 states the purpose of these two zones as follows:

REC-R36: To permit use of designated area for grazing, forestry, mining, recreation, and other activities and to protect the natural resources of the area for the benefit of present and future generations.

AG: To preserve appropriate areas for permanent and temporary agricultural and open space areas as defined herein. Uses normally and necessarily related to agriculture are permitted and uses adverse to the continuance of agricultural activity are not allowed ( [http://kane.utah.gov/deptinfo.cfm?deptID=8&pnl=1\\_2](http://kane.utah.gov/deptinfo.cfm?deptID=8&pnl=1_2) ).

The Land-use Ordinance indicates that surface and underground mines are not allowed in agriculturally zoned areas; however, zone modifications or conditional use permits are permitted following established procedures subject to Kane County Planning Commission approval. (2009/incoming/0006.pdf). The postmining land use for the land is stated as agricultural use, grazing for livestock production, recreation, hunting, and wildlife habitat.

The Kane County Commission sent a letter of support for the project on June 13, 2007 and again during the public comment period on May 16, 2008 (2008/incoming/0063.pdf). The town of Alton sent a letter to Alton Coal Development, May 9, 2008, "hardily" endorsing the mine (2008/incoming/0038.pdf).

Lands prohibited under Public Law 95-87: All lands are on private (fee) surface and coal, except for a small area of federal coal with private surface, which will not be mined. No lands within the permit area are located within the boundaries of any National designation (MRP Section 411.141).

National Register of Historic Places or Parks: No parks (Section 411.141.1) or places included in the National Register of Historic Places (Section 411.140) are found within the area of proposed coal mining and reclamation operations. (However, fourteen sites eligible to the NRHP were identified in a June 2005 inventory of the proposed permit area. Seven of these eligible sites will be adversely affected by the proposed action. A data recovery plan has been implemented and a mitigation plan or a Cultural Resource Management Plan developed for this area and the proposed federal lease area. Concurrence on the mitigation plan for the seven sites was received from SHPO on July 14, 2008 (2008/incoming/pdf 0135))

Within 300 feet from any occupied dwelling, cemetery, or public or community building: No mining will occur within 300 feet of an occupied dwelling, building, school, church, community, institutional building, or public park, or within 100 feet of a cemetery. The Swapp Ranch House is located just outside the 300 foot distance (Drawing 1-5).

Within 100 Feet or Relocation of a Public Road: Kane County Road K3900 (also known as County Road 136 or The Sink Valley Road), a class B multiple use public road, is located within the mine permit area and mining boundaries. Kane County Road K3993 (also known as the Robinson Creek Road) is also located within the mine permit area. The rules allow an exception to unsuitability if: (1) an approval from the road authority is

obtained; (2) public notice and opportunity for public hearing provided; and (3) a written finding is made that the interests of the public and landowners affected will be protected.

The mine proposes to relocate the K3900 road during mining. The road realignment is within the primary jurisdiction of Kane County and includes a right of way across Public Lands issued by the BLM. Approvals have been sought and obtained from the county and BLM to temporarily relocate the road to the west on Public Lands. After reviewing the Environmental Assessment, dated November 2008, the BLM Kanab Field Office Manager issued a FONSI on December 12, 2008 to allow the right-of-way for the road relocation on Public Lands (Appendix 1-7). Kane County and Alton Coal Development entered into an agreement on November 24, 2008 to relocate the road.

Public Notice of the mine permit application and K3900 road relocation was published March 26th through April 16, 2008 in the Southern Utah News (2008/Incoming/0009.pdf). Information concerning K3993 was not published at this time because the Division was not aware that K3993 was a public road. The K3993 road is a two track road that provides access to the Forest Service boundary along lower Robinson Creek. Since this road goes through the mine site, it is proposed that the public be escorted by mine personnel when using the road. No comments on the road or requests for a public hearing for relocation of K3900 were received. However requests for public hearing was received on the mine permit application and the Division noticed the public hearing to receive comment on the mine application and road relocation (2008\outgoing\0018.pdf). The Hearing was held June 16, 2008 in Alton, Utah. The relocation of the road was described at the public hearing. No verbal comments were received on the road relocation. One written comment was received concerning the road relocation. The one comment stated the use of the present road is for moving farm equipment and livestock, activities which are not compatible with mining. The commenter stated that good fencing and cattle guards would be necessary along the realigned road to enable its use for agricultural activity (2008/Incoming/0129.pdf). The BLM EA and FONSI stipulations require that wherever the alignment crosses a maintained fence, a new cattle guard and gate to be constructed to allow the allotment to remain useable.

Director of the Division, John Baza, issued a Findings and Order for the informal conference (2008\outgoing\0024.pdf) within 30 days of closing the conference. The findings associated with K3900 were: (1) there is not sufficient information concerning the details of the road relocation to make the necessary findings; (2) additional information will be available when the right-of-way is issued and Kane County and Alton Coal Development are in final agreement; and (3) when additional information is available the Division will provide opportunity for public hearing and a finding concerning the road relocation.

Once public notice is again provided and if no additional concern is identified on K3900 or on the temporary closure of K3993, the Division could make a finding that the interests of the public and landowners affected will be protected based upon the following:

- The re-routed road will not be used as a mine road or haul road. The relocation provides for public health and safety by rerouting the road outside the mine permit area so that public use and mine use is separated. Once mining concludes the road will be reestablished to near its original configuration.
- The relocation of the K3900 road starts about 2 miles south of the town of Alton at the north end of Section 19. The road will be routed to the west around the mine site and then join back up with the original alignment in Section 31.
- Kane County and Alton Coal Development entered into an agreement titled: An Agreement to Temporarily Close, Relocate, and Replace Kane County Road Number K3900, Known As The Sink Valley Road. The recitals state: "WHEREAS, for the public health, safety and welfare, a portion of Kane County Road K3900 will be relocated outside the boundaries of the Mine Permit Area during the period of mining activities within the Mine Permit Area ("Relocated Section") and then restored to its original location." (Appendix 1-7, County Road 136 (K3900) Approvals and Agreements).
- The FONSI issued by the BLM Kanab Field Office Manager on December 12, 2008 (Appendix 1-7) recognizes in the rationale for the decision that:  
"This relocation provides for more recoverable coal as well as for the health and safety of the public by preventing the interaction of large mining equipment with public traffic."

The mine permit application needs to provide documentation that the mine has approval from the road authority to temporarily close K3993. With these approvals and after public notice and opportunity for public hearing the Division then can make a finding on whether or not the interests of the public and landowners affected will be protected.

### **Findings:**

This review documents the Division's decision as to whether the proposed coal mining and reclamation operation can be authorized in light of the mandatory prohibitions set for in the Act. The final determination cannot be made until a finding is made that County Road K3900 (136) and K3993 relocation and closure protects the interests of the public and landowners. The following findings provide for a preliminary determination of suitability.

- Suitability for permit application is in conformance with State and County land use planning and regulations. State regulations and policy promote multiple uses, and support and encourage mineral development. Kane County land use plans recognize the mineral resources of the county and their importance to the

---

GENERAL CONTENTS

---

economic stability of the county. Kane County and Alton Town Inc. are supportive of the mine.

- The area to be mined is within private surface and coal except for a small area of federal coal that will not be mined. There are no Federal lands or adjacent Federal lands prohibited under Public Law 95-87 proposed to be disturbed by coal mining.
- No parks or places included in the National Register of Historic Places are found within the area of proposed coal mining and reclamation operations.
- No mining will occur within 300 feet of an occupied dwelling, building, school, church, community, institutional building, or public park, or within 100 feet of a cemetery.
- Kane County Road K3900 (also known as County Road 136 or The Sink Valley Road), a class B multiple use public road, is located within the mine permit area and mining boundaries and will be relocated during mining. Public Notice and Hearings have been conducted on the relocation. County and BLM approvals have been obtained for the relocation. This document makes a preliminary finding that the interests of the public and landowners affected will be protected; however as directed by Director Baza's Order the Division must provide additional opportunity for public hearing and a final finding concerning the road relocation made. No finding can be made on public road K3993, until after the opportunity for public hearing has run its' course. The Public Notice was made in Southern Utah News on March 25, 2009.

The following information must be provided, in accordance with:

**R645-103-234.100**, The Applicant must provide documentation that the mine has approval from the road authority to temporary close K3993. [SW]•  
Appendix 1-7 County Road Agreement for relocation of K3900 must include all exhibits that constitute the entire agreement as stated on the signature page of the agreement. [PB]

**R645-103-234.200 and R645-300-123.400**, Ownership or public easement for the unimproved road running east/west along Robinson Creek (K3993) should be described in the PAP. [SW]

**R645-301-115.100**, The Applicant must acquire a zone modification or conditional use permit for mining in an Agricultural Zone from the Kane County Planning Commission. [SW]

## **PERMIT TERM**

Regulatory References: 30 CFR 778.17; R645-301-116.

### **Analysis:**

The permit term of five years will allow for the three year mining plan and reclamation of the last 1000 ft. of highwall within a single permit term. The applicant has not requested a longer term. Section 116 of the application describes the acreage to be mined during each of the three years of mining activity. The disturbance sequence is shown on Dwg. 5-2. A total of 433 acres will be mined.

### **Findings:**

The information provided meets the requirements for a five-year mining permit.

## **PUBLIC NOTICE AND COMMENT**

Regulatory References: 30 CFR 778.21; 30 CFR 773.13; R645-300-120; R645-301-117.200.

### **Analysis:**

A draft of the public notice was provided with the application in Appendix 1-5. A revised version of this notice appeared in the Southern Utah News from March 26 through April 16, 2008. A copy of the public notice, as it appeared, was sent to the Division by email on April 2, 2008 and was made part of the public record (2008/Incoming/0009.pdf). The notice indicated that the public comment period would run for 30 days after the last notice. i.e. until May 16, 2008. Within this timeframe, supportive comments were received from the Kane County Commission, Representative Mike Noel, Alton Mayor Claren Heaton, the Utah Mining Association and from 6 regional residents (from Kanab, St. George, Cedar City, and other unspecified locations). Supportive comments focused on the need for jobs and industry in the region and the need to provide for energy independence.

Also within this time frame, negative comments were received from 7 out of state residents (Alaska, Pennsylvania, Ohio, Nevada and unspecified locations); 8 regional residents (Kanab, St. George, Santa Clara, and other unspecified locations) and one housing subdivision corporation east of Bryce Canyon National Park and the organization Save Our Air & Resources (Richfield Utah); one Hatch resident; and 16 Panguitch business and homeowners whose main concerns were the affects to the tourist industry by the transportation of coal (300 trucks daily) in the SR 89 corridor (recently designated the "Mormon Pioneer Heritage Highway") and through the Panguitch National Historic District; the affects of coal truck traffic on safety; the affect of particulates on visibility and the affect of lighting on the night sky; the displacement of wildlife; the affects to water resources from selenium and mercury; and the affects of a haul route through

---

GENERAL CONTENTS

---

Alton. Three of these petitioners requested an informal conference based upon these issues.

The Division's agency notification letter (2008/Outgoing/0002.pdf) indicated the comment period would end on May 22, 2008 (not realizing how quickly the public notice would be published). Consequently, several more comments were received by May 22, including comments from the Southern Utah Wilderness Alliance, 13 southwestern region residents (Kanab, Cedar City, and unspecified), 4 Panguitch residents, 2 Hatch residents, and 2 Alton residents, all of whom were not in favor of the proposal. Three of these commenters requested an informal conference. In addition, the SUWA requested "Consulting Party Status" for cultural resource management.

Also received by May 22 was a supportive comment from one individual from the Southwestern region of Utah whose location was unidentified. In all 43 comments were received on or before May 22, 2008.

The Division has provided public notice in the Garfield County News and the Southern Utah News two weeks prior to the informal conference which was held on June 16, 2008 in Alton. (In addition, each commenter was notified individually of the conference.) Written findings from the Informal Conference were made on July 18, 2008 (2008\Outgoing\0024.pdf). The Findings require that the Division or County provide for another public hearing on the relocation of the County road to determine whether the public health and safety will be protected. A notice of temporary road closure was published in the Southern Utah News March 25, 2009 in accordance with R645-1-3-234, Suitability and the requirements of the July 18, 2008 Informal Conference Findings.

The Division has received comments with regard to this specific Coal Hollow application, for development of fee coal, from the following agencies:

- Powell Ranger District of the Dixie National Forest (2008/Incoming/0048.pdf)  
The USFS Service expressed the same concerns as the community: that the area is of importance for tourism, that the traffic on SR 89 is made up of large recreational vehicles traveling to Bryce Canyon N.P., Zion N. P., and the Grand Canyon N.P; that the Class I air shed should not be degraded, since the night sky quality was part of the visitor experience and tourism makes up 60% of the economy.
- Office of Surface Mining (2006/Incoming/0008.pdf) stated that no federal mine plan approval was required.
- State Historic Preservation Office (2007/Incoming/0022.pdf)  
The Division has been coordinating the UAC 9-9-404 review of this project with SHPO and has contracted with PLPCO for an archaeological review of the PAP.

The Governor's Resource Development Coordinating Council also had a public/agency comment period. The RDCC did not provide any comments to the Division.



**Findings:**

The information provided by the Applicant has met the requirements for public notification. The Division is attempting to fulfill its requirement to include the public in the permitting process. Written findings from the Informal Conference were made on July 18, 2008 (2008\Outgoing\0024.pdf). The Findings require that the Division or County provide for another public hearing on the relocation of the County road to determine whether the public health and safety will be protected. A notice of temporary road closure was published in the Southern Utah News March 25, 2009 in accordance with R645-1-3-234, Suitability and the requirements of the July 18, 2008 Informal Conference Findings.

**FILING FEE**

Regulatory Reference: 30 CFR 777.17; R645-301-118.

**Analysis:**

The \$5.00 fee was paid with the application.

**Findings:**

The Applicant has met the requirements of the filing fee.

**PERMIT APPLICATION FORMAT AND CONTENTS**

Regulatory Reference: 30 CFR 777.11; R645-301-120.

**Analysis:**

Appendix 1-6 contains a statement of the mine permit application's veracity and accuracy from Chris McCourt, the manager and resident agent for Alton Coal Development, LLC. The information provided is in a format prescribed by the Division.

**Findings:**

The information provided is in a format prescribed by the Division and meets the requirements of R645-301-121.300. Elsewhere in this technical analysis, the Division makes requests for further information or requests clarification.

**REPORTING OF TECHNICAL DATA**

Regulatory Reference: 30 CFR 777.13; R645-301-130.

**Analysis:**

Analytical data is accompanied by the names of the individuals or firms responsible for collection and/or analysis of the data. A list of individuals and consulting firms contributing to the Mining and Reclamation Plan is found in Section 130.

**Findings:**

The information provided meets the requirements of the Utah Coal Rules.

**MAPS AND PLANS**

Regulatory Reference: 30 CFR 777.14; R645-301-140.

**Analysis:**

Maps of the permit area are provided on a scale of 1:6,000 (1" = 500 ft.) or less 1:1200 (1" = 100 ft). Maps of the adjacent area are provided on a scale of 1:24,000 (1" = 2,000 ft.), unless otherwise noted as a deficiency within this technical analysis. There are no previously mined areas within the currently proposed permit area (Sec. 521.110, p. 5-8).

The overburden removal sequence is shown on Dwgs 5-16, 5-17, 5-18, and 5-19. The lower Robinson Creek diversion is shown on Dwg 5-20 (scale of 1:1200) and 5-21. The reclamation sequence is shown on Dwg 5-37 and 5-38 for the three year mine plan reclamation and on Dwgs 5-35 and 5-36 for the extended permit area scenario, requiring acquisition of the adjacent federal leases.

An unnumbered drawing included with the December 2008 submittal shows the Applicant's estimation of the extent of the adjacent area. "Adjacent area" is a defined term in R645-100, meaning the area outside the permit area where a resource or resources....are or reasonably could be adversely impacted by proposed coal mining and reclamation operations.

The Division is not, at this time, accepting or rejecting the Applicant's mapping of Adjacent Area designation, but will evaluate adjacent area under the probable hydrologic consequences and cumulative hydrologic consequences sections of this technical analysis. The adjacent area for other resources is discussed for each resource that could be adversely impacted.

**Findings:**

An unnumbered drawing included with the December 2008 submittal shows the Applicant's estimation of the extent of the adjacent area. "Adjacent area" is a defined

term in R645-100, meaning the area outside the permit area where a resource or resources....are or reasonably could be adversely impacted by proposed coal mining and reclamation operations. The Division will evaluate the Applicant's adjacent area map and discuss adjacent area designation in the context of the Cumulative Hydrologic Consequences (CHIA) document.

## **COMPLETENESS**

Regulatory Reference: 30 CFR 777.15; R645-301-150.

### **Analysis:**

The first application was received on June 27, 2006 and was determined incomplete on August 22, 2006. The second application was received on June 14, 2007 and was determined incomplete on August 27, 2007. Supplemental information to the June 14, 2007 application was received on January 24, 2008. The Applicant was notified that the application package (combined information received June 14, 2007 and on January 24, 2008) was considered complete on March 14, 2008 (2008/Outgoing/0001.pdf and 0001a.pdf).

### **Findings:**

The Applicant has met the completeness requirements.

## ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

### GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

#### Analysis:

Approximately 7,000 ft. elevation, gently sloping land vegetated with Utah juniper, pinyon pine, big sagebrush and wet meadows. Lower Robinson Creek (runs east west on the north of permit area). Sink Valley Wash (runs north south on the east of the permit area). There are several springs and agricultural ponds on eastern boundary of the proposed permit area. The average annual precipitation is 16.43 inches, evenly distributed throughout the year. The current and post mining land use is undeveloped rangeland (wildlife) and livestock pasture (grazing).

A description of the hydrologic environment of the Coal Hollow Mine site and surrounding area is provided in Section 721. Baseline information is presented in Section 724. The climatic conditions (App. 7-6), geology and hydrologic conditions (App. 7-1), groundwater and surface water resources, monitoring and evaluation (App. 7-4) document site conditions are shown in sections indicated.

#### Findings:

The information provided meets the requirements of the Rules for general resource information.

### PERMIT AREA

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

#### Analysis:

In Section 112.500, the applicant provides a table that lists the permit area by the number of federal, state and fee acres. This permit area is shown on Dwg. 1-3 and 1-4. Mining is on fee land only. Section 116.100 provides a listing of the number of permit acres to be disturbed by mining in each phase (year) of the mining.

The Permit applicant re-submitted the following maps to utilize the following R645 Coal Mining Rules terminology, "permit boundary" and "permit area";

- a) Drawings 1-1 through 1-4
- b) Drawing 2-2

- c) Drawing 3-1 through 3-6
- d) Drawing 5-1, 5-2, 5-3, 5-9, 5-10, 5-13, 5-14, 5-15, 5-16, 5-16, 5-17, 5-18, 5-19, 5-20, 5-21, 5-22, 5-23, 5-25, 5-26, 5-27, 5-33, 5-34, 5-35, 5-36, 5-37, 5-38, 5-39
- e) Drawings 6-1, 6-2, 6-5, 6-9
- f) Plates 3 and 4 of App. 7-7 Report
- g) Drawings 7-1, 7-2, 7-3, 7-10, 7-12.

Kane County Road #136 and Road K3993 will remain under the jurisdiction of Kane County and same will be maintained by the County as a public road (See Appendix 1-7). The Kane County Road K3900 (136) Closure, Relocation and Replacement Agreement, Miscellaneous Provision C are contained on Page 7.

**Findings:**

The information provided in the proposed amendment is adequate to meet the requirements of this section.

**HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.12; R645-301-411.

**Analysis:**

The application for the Coal Hollow Mine includes the following cultural resource information (located in confidential files):

- 6/14/07 Cultural Resource Inventory
- 6/14/07 Paleontological Survey
- 6/14/07 Geologic Report of the impacts of Bedrock and Surgical Units on the Distribution of Cultural Resources at the Alton Coal Field
- 6/14/07 Data Recovery Plan for identified Cultural Resources
- 6/25/07 Revised Data Recovery Plan
- 1/9/08 Draft Outline of Cultural Resource Management Plan, CRMP
- 02/28/08 2<sup>nd</sup> Revision to Data Recovery Plan
- 02/28/08 Excavation Permit Application
- 03/14/08 CRMP
- 05/23/08 Revised CRMP

On November 2, 2007, the Division sent a letter to Dr. Matthew Seddon, State Historic Preservation Officer, requesting concurrence with the Division's determination and eligibility effect determination for the proposed Coal Hollow Mine. Dr. Seddon concurred with the Division's determination by way of correspondence dated November 20, 2007. However, because of adverse impacts and cumulative effects associated with the lease application on federal land, a Cultural Resource Management Plan, (CRMP)

was developed in addition to the Data Recovery plan. To date several revisions to the Data Recovery plan and a Cultural Resource Management Plan, (CRMP); have been submitted to the Division for review and comment. The CRMP dated 05/23/08 and Data Recovery Plan dated 02/28/08 were the documents included in this review.

## CRMP

**Introduction – Page 1** – Because of the need for the CRMP to fully describe the entire project area and the complexity of the issues, this section had been expanded to fully describe the project area and cover the compliance needs of UDOGM, OSM, BLM, and other involved agencies. The additional information required to address these deficiencies noted in the CRMP was included in pages 1 through 3, of the revised CRMP and included:

1. *A description of the entire project area, making clear the distinctions between private, BLM, and transportation routes.*
2. *A description of the relevant laws (e.g. NEPA, Section 106, Utah Code 9-8-404, etc.) and how they apply to the project.*
  - a. *This description makes the necessary distinctions between directly and indirectly connected actions. Indirect effects, such as transportation are described here.*
  - b. *The involved agencies and their roles are described in this section.*
3. *The section notes that all involved agencies are aware that while not directly connected, the actions are related, and that therefore a comprehensive approach to Section 106 and Utah Code 9-8-404 compliance is being undertaken via this document.*
4. *A summary of the general cultural resources approach as described is included at the conclusion of this section, page 3, paragraph 2.*

**Effected (sic) Environment – Page 1 on** – This section has been revised to:

1. *Include the entire project area, including potential transportation routes, with maps, rather than focusing solely on the archaeology.*
2. *Provide a description of the compliance project and associated compliance issues.*

3. *Table 2 included other cultural resources such as the National Register of Historic Places Historic District in Panguitch.*

### **Description of Phases – Page 1 and Page 23-24**

Each phase has been revised to supply data for the subsequent phases. This has been clarified in the current description on page 27 of the CRMP. Phase I is described as “mitigation of immediate impacts,” and the descriptions are more clearly integrated with subsequent phases.

1. *In the introduction, these phases are clearly described with the relationships spelled out directly.*
2. *In the expanded discussion, the way the data from Phase I will tie to subsequent phases has been clarified.*
3. *Either in the CRMP or in the Data Recovery Plan clearly describe how sites x, y, & z (presumably all prehistoric) are expected to relate to the other sites in the BLM area – that is how do the Archaic sites in the private area compare to the Archaic sites in the BLM area and the Proto Historic private to BLM?*

Page 24, paragraphs 2 and 3 of the Data Recovery Plan describe how the prehistoric sites, Archaic, in the private area are expected to relate to the other sites in the BLM area – that is how the Archaic sites in the private area compare to the Archaic sites in the BLM area and the Proto Historic private to BLM.

**Consequences of Project Phases, Phase II, Page 24** – As currently stated this reads, “Research would precede to Phase II, upon Alton Coal Development, LLC’s acquisition of federal coal managed by the Bureau of Land Management.”

Page 27, paragraph 2 of the revised CRMP states that “*Phase II and III cover the possible federal undertaking resulting from the lease of the Alton Coal Tract...*” This revised text is correctly stated.

*Please clarify what the relationship is.*

The text on Page 27, paragraph 2 through page 31 of the revised CRMP adequately clarifies the relationship of the project phases of the current private and possible future federal coal tracts.

### **DATA RECOVERY PLAN**

Many of the comments on the original data recovery plan have been addressed. The review of the most recent Data Recovery Plan submitted on February 28, 2008

indicated that there were deficiencies that need to be addressed before the plan could be approved. They were outlined as follows:

### Research Questions

As currently written, these research questions seem too broad for the collection of sites present. The comments on 12/18/2007 assumed that these questions would actually be for the CRMP where broad over-arching questions forming the context for site-specific research issues should be posed. In the case of these sites, the research questions are so broad that they probably cannot be addressed by the limited range of sites present and the limited work proposed.

***The research questions need to be tailored specifically to the sites in question and for what they can address. Clearly describe how sites x, y, & z (presumably all prehistoric) are expected to relate to the other sites in the BLM area – that is how do the Archaic sites in the private area compare to the Archaic sites in the BLM area and the Proto Historic private to BLM.***

The geomorphological element is key here especially for informing Phase II and III, but again, the real first or otherwise question here is what data do these sites really offer. Also, there aren't any Fremont/Anasazi sites in this phase – how will that inform later questions? Finally, what if the historic site (or the others for that matter) yield data that goes beyond the scope of your original questions? Will those sites proceed to the next phase?

### ***Goal 2 of the original draft, surface and subsurface***

This goal does not appear to be included in the current version of the Data Recovery Plan. It was highly relevant, and was suggested on 12/18/2008 that the question be refined a bit. It was stated that:

*In terms of the surface/subsurface question, which we agreed was good and was at least partially met by the excellent random sampling strategy (a provision for expansion would probably cover most other areas); we suggested further clarification of what that question entails. Thus, instead of simply asking, "does the surface represent the subsurface," we recommended elaborating into all the related questions like "Do surface diagnostics reflect overall site dating?" "Are the functional interpretations derived from the surface assemblage supported by the subsurface assemblage?" "Does a site that appears to have significant data based on surface information have such data and what, if any, indicators in the surface assemblage suggest the presence of significant subsurface deposits?" "How much excavation is necessary in order to obtain a representative sample of subsurface artifacts?" "Can geomorphological evidence be effectively used to determine if the surface and subsurface assemblages are chronologically and functionally related?" And so on. Refining these questions may require slight refinements in the excavation/analysis approach.*



Considering the relevancy in the first draft, it is also relevant for the second draft with some refinement. This question is perhaps the most relevant question that the current collection of the sites can address.

Page 25, paragraph 2 of the Data Recovery Plan describes how the surface and subsurface assemblages have been refined to include differences or similarities.

### **Curation**

MOAC does not have a 2008 Provisional Repository Agreement (although the form has been submitted) with the Utah Museum of Natural History. Has MOAC contacted Kara Hurst, Registrar from the UMNH, and obtained an actual Repository Agreement?

*For the phase I data recovery, there will need to be a legally executed, signed, transfer of title for the prehistoric artifact recovered from private land, which will grant title to the UMNH. Finally, an outline for how historic artifacts will be curated needs to be included.*

This comment is intended as a reminder to the applicant. Page 40 paragraph 3 of the revised Data Recovery Plan includes a description of the curation methods for prehistoric materials. According to the interpretation of the information in this paragraph, a detailed field analysis will be conducted for historic period artifacts the applicant does not intend to collect historic materials.

The following comments and suggested changes pertain to the Federal portion or phase II of the CRMP. They need to be addressed prior to entering this phase of the CRMP. The applicant may chose to address these comments and suggested changes during this review process or prior to obtaining a SMCRA permit for additional federal activities.

### **CRMP**

#### **Consequences of Project Phases, Phase I, Page 23 (also, Phase III Page 24)**

The description of the public involvement process on the bottom of this page and on the bottom of Page 24 does not meet the previous suggestions. In an email to the entire project team that was sent on 1/22/2008 it was stated that:

*"Given the high public interest in this project, and the overall size of the potential effects, I recommend that the public be more involved than is usual (i.e. be more than simply the passive recipients of whatever mitigation project we archaeologists deem they are worthy of receiving). I suggest that planning for public input into the research design and excavation approach be established in*

*the CRMP. Let's define "the public" based on the interested parties (more than just USAS, probably also members of the towns of Alton and the surrounding area, tribes, as well as other citizens of the state). Let's then find out what the public are interested in learning and receiving from this project. It is their heritage; their interests should go right into the research design. The public should also be consulted early and often regarding "public mitigation products." We should not simply decide what they want out of it. The CRMP seems to be a good place for laying out a good process for both identifying the relevant public and defining meaningful consultation with that public."*

As currently stated, public involvement has already determined that only USAS chapters are relevant. Furthermore, the public involvement occurs well into mitigation efforts and has already determined a particular public outcome. This does not meet the comments provided above. The CRMP needs to include a public involvement plan that:

1. Makes efforts to fully define and identify stakeholders (beyond USAS) who have interests in the cultural resources in this project area. This needs to start at the beginning of the project, not at Phase III (as suggested on Page 24). As currently stated, the Phase I public outcome has already been determined and the only open-ended input will be taken when Phase III is well underway.
2. Provides a process for incorporating public interests and desired mitigation outcomes into the decision of what public products will be part of the project.

In other words, we need to find the public, listen to what they want, weigh and consider the input, and then provide public output that meets those interests and not what a bunch of professional archaeologists think that some small segment of the public would want.

The following additional comments excerpted from Christopher Hansen's, SHPO, email to Matt Seddon on 5/7/08 are worth noting. As the project develops, they will be given consideration:

Right now, the historic district comes to mind (what does the NR nomination say about Panguitch and particularly Panguitch's Main Street, does it have character defining features that might be impacted by the intrusion of so many new trucks?), what about vibrations from the trucks--does UDOT or FHWA have any concrete studies? From what I recall Panguitch also had a Main Street program at one time too, clearly the historic character of their downtown has been an important asset to the community.

#### **Overarching Research Design (Currently missing from CRMP)**

In the email on 12/18/2007, Lori Hunsaker, PLPCO and Matthew Seddon, SHPO communicated that they:

*... were initially confused about the relationship of the treatment plan to the agreed-upon CRMP. We now understand it as something that will be part of the overall CRMP, and the research design specified in the draft document will basically form the nucleus of the sections of the CRMP research design that cover non-diagnostic open-air lithic scatters and the historic research design.*

Currently there is only a culture history, no research design in the CRMP. The CRMP will need an overarching research design prior to going into Phase II. Assuming that the research questions posed in the current Phase I treatment plan are the "nucleus" as discussed in the comments above, for the moment these could be inserted into the CRMP. However, prior to ultimate finalization of the CRMP, we have the following comments that we recommend be incorporated into this overarching research design:

Previous comments on a draft of this plan were provided in an email to the authors with copies to other team members on 12/18/2007. Comments are confined to areas where those previous comments appear to have not been addressed.

**Research Domains and Questions – Pages 24 on** – A reference to one portion of the Kern report (page 28), and a very general question about "how systems compare" to Coral Canyon, Quail Creek, and Sand Hollow sites (page 28) are included in this section of the CRMP. More refined research questions are required in order to make data recovery and subsequent research more efficient. Therefore, the following information needs to be incorporated into the Research Domains and Questions section of the CRMP:

#### Research Domains and Questions

The broader research design needs to incorporate the spate of recent work (e.g. Kern, Sand Hollow, HRA's work near St. George, Joel Janetski's work in Escalante) that provides refined research questions for the broader region and which are applicable to the Alton Amphitheater/Sink Valley area".

#### Research Domain 1 – Chronology -

Berry, Chapter 27 in Kern Report Vol IV – Page 581 on Virgin Anasazi dating

Reed, Chapter 29 in Kern Report Vol IV, Page 601, summarized projectile point model could potentially be tested or data from project could be evaluated in terms of model.

Revised chronologies have been proposed by Seddon and Reed, Kern Report Vol VI, Chapter 1, as well as for the Archaic period Vol IV, Chapter 10. These models could be proposed as testable or open to refutation or refinement with specific description of how the data from this area can be used for such issues.

#### Research Domain 2 – Site Function, Use History, and Artifact Distributions –

Chapter 11 of the BYU Sand Hollow report describes specific site functional types and models that could be evaluated. These types appear amenable to investigation or testing with data from the project sites.

Vol IV, Chapter 22 of the Kern report provides a detailed discussion of Southern Paiute site function and settlement organization and provides a limited test of the model. It seems that the large number of Southern Paiute sites in this project area could really help test this model if the research design were to explicitly consider this research.

#### Research Domain 3 – Subsistence and Environment

The Sand Hollow report Chapter 11, pages 422-426 provides a detailed discussion of Virgin Anasazi subsistence that can be used to provide more specific research questions.

The Sand Hollow report Chapter 11, pages 426-27 proposes that resource stress results in particular patterns of intensification that the large number of sites in the project area appear directly amenable to addressing.

The Sand Hollow report, Chapter 11, pages 428-434 (and referencing a significant body of work) examines questions of Southern Paiute horticulture that the large number of Late Prehistoric sites seem able to address.

The Sand Hollow report, Chapter 11, pages 435-439 proposes a model of post-contact Southern Paiute subsistence that the sites in the project area may be able to address.

The model of diachronic patterns in faunal exploitation in the Kern report, Vol IV, Chapter 30 and the model of diet breadth through time (Chapter 31) appear to provide fodder for relevant research questions. These questions can be much more refined than the very general questions posed in 3.2 of the draft report.

#### Research Domain 4 – Technology

The Kern report, Vol IV, Chapter 34 refines and defines a model of technology and mobility that can be used to develop more refined questions, particularly the conclusions on Page 683.

If thermal features are of interest, as suggested by question 4.2, the Kern report, Vol IV Chapter 9 provides a very explicit model of variation in thermal feature types over time that could be tested if features are found in the project area.

Models of pottery manufacture and mobility, such as Simms and Bright and the Kern report, Vol IV, Chapter 17, appear very relevant to this project area.

The Kern report, Vol IV Chapter 38, provides models of trends in ground stone technology that could be used to refine the ground stone technology issue questions (3.3 and to some degree 4.1)

#### Research Domain 5 – Settlement Patterns and Mobility

The Sand Hollow report, chapter 11, pages 441-443 provides a number of theoretical models (population packing, hinge points, Virgin Anasazi subsistence, etc.) that while applied in the Sand Hollow report to the St. George Basin do not seem irrelevant here and which could be adapted for this project.

Vol IV, Chapter 14 of the Kern report, while comparing Fremont and Virgin Anasazi settlement patterns does provide new models of Virgin Anasazi settlement type that could be explicitly examined via research questions based on the model.

Vol IV, Chapter 20 of the Kern report provides a model of Late Prehistoric demography that, given the long time span of the sites in the project area and the large number of Late Prehistoric sites, could be tested with data from the project area.

Given the large number of sites and time breadth in the project area, the issues raised in the model of land productivity and hunter gatherer settlement strategies in the Kern Report (Vol IV, Chapter 33) could be adapted or used as the basis for forming more refined questions than the ones currently posed.

#### Findings:

The information is adequate to meet the requirements of this section of the regulations. Approval from the PLPCO for the excavation of the following eligible sites was granted on July 11, 2008 and received by the Division on July 13, 2008. This approval included sites 42KA2042, 42KA2068, 42KA6104, 42KA6105, 42KA6106, 42KA6107 and 42KA6108. Approval from the PLPCO for the excavation of the following eligible site was granted on November 12, 2008 and received by the Division on November 13, 2008. This approval included sites 42KA2044. SHPO concurrence for this site was received by the Division on November 13, 2008.

## CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.18; R645-301-724.

#### Analysis:

The application discusses the climatological factors representative of the proposed permit area in Section 724.400 and Appendix 7-1. Table 7-3 summarizes climatological information from the Alton weather station located approximately 2 miles north of the proposed mine: data were collected from 1928 to 2005. Drawing 7-8A presents the data

graphically. The Applicant installed an automated weather station at the proposed mine site in December 2005. The station continuously measures and records temperature, wind velocity and direction, and precipitation, although the rain gauge is not operative in the winter. Drawing 7-8B plots daily maximum and minimum temperatures at the Coal Hollow Mine site for from January 2006 to May 2007. Appendix 7-6 contains climatological data for both the Alton and Coal Hollow weather stations. Speed and direction of prevailing winds at the proposed mine site are shown on rose diagrams in Figure 4 of Appendix 7-1.

The site has an average annual precipitation of 16.38 inches per year (Section 724.411). Wind data since 2005 are plotted in wind rose diagrams showing the average velocity (6 mph) and predominate direction (from the northeast) (Fig. 4, App. 7-1). Temperatures have been measured and summarized in Table 7-3.

### **Findings:**

Climatological Resource Information in the application is adequate to meet the requirements of the Coal Mining Rules.

## **VEGETATION RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.19; R645-301-320.

### **Analysis:**

Plant communities within the proposed permit area and reference areas are described in Vol. 2, Chap. 3. The descriptions include acreage, percent of total by community, total living cover, percent cover by shrubs, grasses, forbs and woody plant species, for;

- The proposed Disturbed Sagebrush/Grass Community
- The Sagebrush/Grass Reference Area
- The Proposed Disturbed Meadow (Dry) Community
- The Meadow (Dry) Reference Area
- The Proposed Disturbed Pinyon-Juniper Community
- The Pinyon-Juniper Reference Area
- The Proposed Disturbed Pasture Land Community
- The Pasture Land Reference Area
- The Proposed Disturbed Oak brush Community
- The Oak Brush Reference Area
- The Proposed Disturbed Meadow Community
- The Meadow Reference Area
- Other Meadow Communities

Tables 3-1 through 3-33 include living cover and frequency by plant species, total cover and composition and woody species density. Table 3-34 includes pounds per acre "biomass production" for each plant community.

Appendices 3-2 and 3-4 include the methodologies, maps, sampling design and transect/quadrat placement, cover and composition, woody species density, sample size and adequacy, statistical analyses, photographs and threatened and endangered plant species, results, summary and discussion and color photographs for the referenced communities.

### **Findings:**

The information is adequate to predict the potential for re-establishing vegetation and the productivity of the land within the proposed permit area for surface coal mining and reclamation activities. The information is adequate to meet the requirements of this section of the regulations.

## **FISH AND WILDLIFE RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 784.21; R645-301-322.

### **Analysis:**

Fish and Wildlife information for the permit and adjacent areas is included in Vol. 2, Chap. 3, Sec. 322. Agency consultation and studies conducted are listed on page 3-32 and 3-33.

Site specific resource information as required by section R645-301-322.200 of the regulations is included in the confidential portion of the application.

Threatened, Endangered, and Candidate plant and animal species for Kane County are included in table 3-35. A brief narrative for each species describing surveys conducted to verify their presence (or the rationale for their absence) needs to be included in the application. i.e. MSO protocol and survey results.

High Value habitats for black bear, rocky mountain elk, mule deer, and sage grouse are described on page 3-35 of the application. In 2006 UDWR changed the terms utilized for habitat designations. The term "high-value" habitat are now designated as "crucial", and should be changed as such throughout the document. The information is derived from the DWR GIS database indicating that these four species occur within or adjacent to the proposed disturbed area. Additional information for the sage grouse is included in Appendices 3-1 and 3-3.

### **Maps and Aerial Photographs**

Vegetation communities, reference areas are delineated on drawing 3-1. Drawings 3-2 through 3-5 include the habitat for the high value wildlife species, black bear, rocky mountain elk, mule deer, and sage grouse. Drawing 3-1 has been revised to include vegetation information pertaining to the county road realignment but does not include the proposed relocation of the county road.

**Findings:**

The information is not adequate to meet the requirements of this section of the regulations. Prior to approval the following information must be provided in accordance with:

**R645-301-322.200**, In 2006 UDWR changed the terms utilized for habitat designations. The term "high-value" habitat is now designated as "crucial", the new designation needs to be noted in the appropriate section(s) of the application. Please replace the term in the MRP. [JH]

**R645-301-323**, Drawing 3-1 Vegetation Map and Dwgs. 3-2 through 3-5 (wildlife maps) need to be revised to include the proposed location of the temporary county road realignment. [JH]

**SOILS RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

**Analysis:**

The application includes a non-prime farmland determination by the National Resources Conservation Service in Appendix 2-1, Section 1). The Order II soil survey in Appendix 2-1 includes field description of soil pits, laboratory analysis of samples taken by horizon, and a soil map (Dwg 2-1). The soil survey classifies the soil into thirteen family map units. These map units are described in the text (Section 222.200) and representative pedons are provided for each unit. Sections Two and Three of Appendix 2-1 provide greater detail on the classification and naming of the soils and the typifying pedons for the soils. Productivity estimates are provided in Section 321.200. Topsoil and subsoil will be salvaged for use in reclamation, no substitute or borrow soils will be needed.

**Findings:**

The information provided meets the requirements for baseline soil survey information as required by the R645 Coal Rules.



## **LAND-USE RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.22; R645-301-411.

### **Analysis:**

Chapter 4, Section 410 describes the current land uses for the Coal Hollow project. They include zoning for agricultural use, grazing for livestock production, recreation, hunting and wildlife habitat. Drawing 1.3 describes the land status (private) of the proposed permit area. Land capability information is included on page 4-4 of Chapter 4. Chapter 3 describes land capability in terms of percent cover for the vegetative communities in the permit and adjacent areas. The application also includes a description of the land capability in terms of supporting livestock, 1.125 AUM's, (animal unit month) for the Pugh and Dames properties. A description of the existing and proposed post-mining land use is included in the following paragraphs:

#### **The Management Plan for the Richard Dame Property**

The current land use of Mr. Dame's property is forage for domestic livestock and some wildlife species. The land includes irrigated pasture for cattle and some horses, native stands of pinyon juniper and sage brush communities as noted on map 3-1, Vegetation. Mr. Dame's property will be returned to pasture land for domestic livestock with some plant species for wildlife habitat. Table 3-19 includes the seed mix, native and introduced grasses and forbs, to be planted to meet the landowner's request. A copy of the signed management plan is included in appendices 4-3 and 4-4.

#### **The Management Plan for the Burton Pugh Property**

The land owned by Mr. Pugh currently provides forage for livestock and some wildlife species as well. The land includes sub-irrigated pasture land, meadows, sagebrush/grass, pinyon juniper and oak brush communities as noted on map 3-1. The livestock on the property are mostly cattle and sometimes horses. Mr. Pugh's land will be restored to its original use for livestock grazing and wildlife habitat. The seed mix will include plant species used by wildlife species in addition to native and introduced grasses. A portion of the property will be reclaimed to sage -grouse habitat as well. A copy of the signed management plan is included in appendices 4-3 and 4-4.

### **Findings:**

The information is adequate to meet the requirements of this section of the regulations.

## ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

### Analysis:

#### Alluvial Valley Floor Determination

The applicant has made a request for determination of alluvial valley floor for the proposed Coal Hollow Mine and Sink Valley Wash area.

#### Background Information

The Alton/Sink Valley area was the subject of a much larger, mine permit application in 1982 and 1987 by Utah International Inc. (UII, P/025/003). The UII application included the Sink Valley area in T 39 S, R. 5 W. and surrounding federal leases in T. 39 S., R. 6 W.; T. 40 S., R. 4 W.; T. 40 S., R. 4 ½ W; T. 40 S., R. 5 W; and T. 40 S., R. 6 W. The federal leasing required an Environmental Impact Statement (Development of Coal Resources in Southern Utah, 1979). The Office of Surface Mining (OSM) commissioned a reconnaissance report of the alluvial valley characteristics of the Alton Area in 1980. The resulting report, by Jack Schmidt was titled, "Reconnaissance Determination of Alluvial Valley Floor Status and Assessment of Selected Geomorphic Parameters in selected Stream Valleys of the Alton Petition Area and Adjoining Lands, Garfield and Kane Counties, Utah." The Schmidt report details agricultural production, water rights and water diversions in the Alton amphitheater and Johnson Canyon at the time. The report describes a very active agricultural community in Sink Valley and adjacent areas. (Jack Schmidt's full 1980 report can be found at 025/0005/2006/Incoming/0012.pdf.)

In 1983, OSM mapped the Sink Valley alluvial valley floor (AVF) and stressed the importance of agricultural land use in making the Sink Valley AVF determination, in the absence of more typical geology associated with an alluvial valley (OSM 1983 [draft] Alluvial Valley Floor Identification and Study Guidelines, Appendix D, pg. D-2 and D-6). OSM stated that the initial reconnaissance conducted of the Alton area by Jack Schmidt in 1980 was sufficient to confirm the existence of an alluvial valley floor based upon the importance of the valley land to agriculture (pg. D-4), but suggested that an Applicant for a mine permit might collect additional data to clarify the regional hydrologic pattern (page D-2).

OSM was required to make specific detailed findings with regard to the protection of the hydrologic balance and reclamation during the processing of the Alton mine permit application (which included tracts of federal leases) in response to petition and litigation in United States District Court for the District of Utah, Central Division (0250003/1987/Incoming/0040.pdf). The Court's Memorandum of Decision and Order was dated February 12, 1985.

The February 8, 1988 Initial Completeness Review for the 1987 UII Alton Mine application indicates on page 34 that the following areas were identified as probable alluvial valley floors (filed as 0025/0003/1988/Incoming/0023.pdf):

1. Upper Skutumpah Creek, Sec. 20 and 29, T40 S., R 4 1/2 W.
2. Skutumpah Creek, Sec. 30, T. 40 S., R. 4 1/2 W.
3. Thompson Creek and Tributaries, Sec. 30 and 19, T. 40 S, R 4 1/2 W and Sec. 24, 13, 12, T 40 S., R. 5 W.
4. Bald Knoll Hollow, Sec. 14, 15 and 16, T. 40 S. R. 5 W.

The Division further stated in the Initial Completeness Review on pages 35 that the following areas had been "positively" determined to be Alluvial Valley Floors:

1. Skutumpah Creek in Sec. 32, T.40.S., R.4 1/2 W. and Sec. 5 and 6 in T.41 S., R. 4 1/2 W.
2. Thompson Creek in Sec. 31, T.40 S., R.4 1/2 W. and Section 6 in T.41 S., R.4 1/2 W.
3. Upper Sink Valley Wash in Sec. 32, T. 39 S., R. 5 W. and Sections 5 and 8 in T. 40 S. R. 5 W.
4. Sink Valley in Sections 19, 20, 29, and 30, T. 39 S., R. 5 W.
5. Lower Swapp Hollow in Sec. 28, T. 39 S., R. 5 W.
6. Kanab Creek in Section 18, 24, 25, 26, and 36, T. 39 S., R. 5 W.
7. Alton Amphitheater in Sec. 6 and 7, T.39S., R.5W. and Sec. 1, 11, 12, and 13 in T.39S. R.6W.

The Coal Hollow proposed permit area encompasses the Sink Valley in Section 19, 20, 29 and 30 in T. 39 S., R. 5 W. The Division's 1988 decision was based upon borehole data showing sorted deposits of sand size or larger particles and previously published information, as laid out in a memo from Richard Smith, Geologist, to John Whitehead, Permit Supervisor, dated November 9, 1987 (025/0003/1987/Internal/0002.pdf).

The UII commissioned Water Engineering Technology, Inc. (WET) of Fort Collins, CO to evaluate the Sink Valley area. The 1988 WET report, titled "Geomorphological and Sedimentological Characteristics of Sink Valley, Kane County, Utah" argued that the sediment in Sink Valley is comprised of coarse material in an alluvial fan laid down by unconfined sheet floods, debris flows and mud flows. The report claims there was never a continuous stream in Sink Valley. Thus, by R645-100 definition, a lack of a continuous stream channel meant an alluvial valley floor in Sink Valley could not exist.

The Division was not persuaded by the WET report. To the contrary, Richard Smith, Division Geologist, viewed the WET report as further evidence of unconsolidated stream-laid deposits holding streams and reported as much to the Division Associate Director, Ken May, on October 13, 1988. His memo cited near surface deposits of sand sized particles, selectively sorted, and deposited within and adjacent to stream channels,

as well as the presence of smooth land surfaces and channels exceeding 3.0 ft. wide X 0.5 ft. deep within Sink Valley, and the established agricultural land use, for a positive determination of an alluvial valley floor in Sink Valley (0250003/1988/Internal/0001.pdf).

In December 1988, Nevada Electric Investment Company (NEICO, a partner in UII) petitioned the Board of Oil, Gas and Mining for review of the Division's AVF determination. At the present time, no record has been located of the outcome of that petition, and there is reason to believe the cause was never heard before the Board. NEICO's assertions that Sink Valley is not an AVF are, in brief, that Sink Valley does not contain a continuous stream, the unconsolidated alluvia do not have the characteristics of streamlaid deposits, and there is no floodplain – terrace complex because the processes need to form them did not and do not exist in Sink Valley: these are similar to the arguments made in the current application.

### **Current Coal Hollow Mine Application**

The Alluvial Valley Floor determination for the 2008 Coal Hollow Mine application has been reviewed by Division staff and is under review by a third party as well.

The 2008 Coal Hollow Mine application includes the WET 1988 investigation in Appendix 7-4; current reconnaissance by Peterson Hydrologic Inc. in Appendices 7-1; and. Alluvial Valley Floor Supplemental Information in Appendix 7-7 that specifically addressed land use, soils, vegetation and hydrologic questions raised by the Division during the 2007 Administrative Completeness review.

In the discussion below, the Division evaluates the application for information pertinent to R645-302-321, in order to make a determination of the extent of any alluvial valley floor within the proposed permit area, and adjacent area, per R645-302-321.300. The applicable R645 Rules are used to organize the discussion.

### **R645-302-321.210 Mapping of Unconsolidated Streamlaid Deposits Holding Streams**

Appendices 7-1 and 7-4 refer to the definition of "alluvial valley floor" in the R645-100 Rules which exclude from an alluvial valley floor all "upland areas...composed chiefly of debris from sheet erosion, deposits formed by unconcentrated runoff ...or other mass movement accumulations..." The term, "upland areas" is also defined in R645-100 and means, "those geomorphic features located outside the floodplain and terrace complex, such as isolated higher terraces, alluvial fans...."

The applicant states that no flood plains or stream laid deposits were identified in the project area, consequently a map of the flood plain and terraces was not created for Robinson Creek and Sink Valley Wash (App. 7-7, pp. 4-5). The Applicant found no

evidence of flood plain and terrace features that are characteristic of alluvial valley floors (App. 7-7, pp. 4-5) and suggests that coalesced alluvial fans form the surface of Sink Hollow Wash (App. 7-7, pp. 2-3). This position is strongly supported by the information presented in Appendix 7-4, the WET Report.

The Applicant suggests the lack of continuous channel is indicative of an alluvial fan, due to deposition by mud flows, sheet floods, and debris flow, but also that the lack of a continuous channel may be partly due to human activity (construction of diversions, ponds). The Applicant refers to Plate 1 in App. 7-7 showing numerous discontinuous channels, but no continuous channel in Sink Valley Wash. The Division notes the discontinuous channels shown on Plate 1 seem to coincide with the historically developed pastureland shown on Dwg 3-1. If the ponds that have been constructed in the channel are taken into account, it is evident that Sink Valley Wash is a continuous channel from its origin in Section 21 Canyon and to the east of the Johnson Ranch; however, in the NW/4 of Section 32, the channel dissipates and the flow is spread across the surface as overland flow, which has been described by the Applicant.

[A deficiency has been written to request that the permit boundary should be shown on Plate 1 for ease of comparison with other (larger scale) plates.]

Neither the federal nor R645 Rules use the term "continuous channel" to define alluvial valley floor. Drawing 7-3, indicates continuous point-to-point diversions along the length of the Sink Valley Wash channel and the USGS Alton Topographic Quad shows a continuous channel for Sink Valley Wash. Figure 19, App. 7-1, shows the tributaries to Sink Valley. The figure and several maps show a stream channel in Sink Valley. Sink Valley has the appearance of an alluvial valley floor, because it once contained a continuous stream channel, which deposited alluvial stream laden sediments. There are undoubtedly both colluvial and stream laid deposits in Sink Valley from past geomorphic activity. After reviewing the information in the PAP and the WET report the Division concludes it's likely that both alluvial and colluvial systems operated to form large alluvial fans along the edge in Sink Valley. In the middle and below Swapp Hollow the streams running from the fan combine to form an alluvial channel down Sink Valley. The stream flows that enter the valley in the early spring are now captured and dispersed along the valley via ponds and diversions. The aerial photograph of Plate 4 shows the surface features in Sink Valley, including the alluvial fan at the upper end of the valley. Most of the main channel has been covered in the past by farming activity, leaving a series of ponds that outline the channel. If the stream flow to the valley were significant, the channel would most likely have been left intact.

Plate 2 shows the surface water drainage patterns, and Drawing 7-7 shows stream patterns. Some of the runoff from Water Canyon is diverted to Robinson Creek while the rest of the water including that from Section 21 Canyon infiltrates into the alluvial fan at the upper end of Sink Valley. It is believed that the finer alluvial that has built up in the middle of Sink Valley as it filled with sediment material retards the groundwater flow in the eastern and western sides of the valley.

ENVIRONMENTAL RESOURCE INFORMATION

---

On October 1 and 2, 2008, Division personnel examined the area for AVF characteristics. They determined that upper Sink Valley Wash, where the mine is proposed, consists of alluvial fan deposits, with no floodplain and terrace complex. There was no consensus as to whether or not there is a continuous channel, even when the impacts of human modifications are accounted for. Although some characteristics of an AVF are present (see definitions for both "Alluvial Valley Floor" and "Upland Areas" in R645-100-200, i.e., unconsolidated stream-laid deposits and agricultural activity supported by irrigation and subirrigation), not all characteristics listed in the definitions in the Coal Mining Rules are clearly present, i.e., stream-laid deposits holding streams with water availability sufficient for irrigation or subirrigation agricultural activities. There is water available for subirrigation and irrigation, but the "stream" through Sink Valley Wash is not the sole source of the water. Subirrigation and agricultural activity also occurs on the edges of Sink Valley where groundwater flows through colluvial deposits from the adjacent hillsides. By definition these conditions do not constitute an AVF. The Applicant plans to mine in the vicinity of the springs and groundwater resource flowing through the colluvium. The Applicant has been directed to submit water rights data to identify any spring and well with state appropriated waters that may have to be replaced.

The ground water supply from Robinson, Water, Section 21 Canons and Swapp Hollow recharge the springs in Sink Valley as well as the deep groundwater system and alluvial stream laid deposits. As mentioned the stream laid deposits are less porous and have less transmissivity than the colluvial deposits. From the WET Report it is interpreted that the stream laid deposits range along the eastern to middle part of Sink Valley beginning below Swapp Hollow and continuing to the lower canyon of Sink Valley. The sedimentary structure of Sink Valley Wash consists of colluvium and alluvial fans deposited by unconcentrated runoff, and there is no floodplain and terrace complex.

In Appendix 7-4, the application describes the origins of Sink Valley through the burial of Tropic Shale by Wasatch sediments brought down from adjacent canyons (Robinson, Dry Creek, Sec. 21 Canyon and Swapp Hollow) and the eventual lowering of Robinson Creek, which siphoned off a portion of the Sink Valley flow, creating a residual alluvial fan bordered by a Tropic Shale ridge. The shale ridge blocks subsurface flow of groundwater to the west, bringing the shallow groundwater system to the surface on the eastern boundary of the permit area as evidenced by numerous seeps and springs shown on Dwg. 7-1 (pp.7-3 and 7-4 Sec. 721, Chap. 7). These seeps and springs either sub-irrigate the lands within, east, and south of the permit area or they fill ponds for domestic, stockwatering, irrigation, or wildlife uses (Table 1, App. 7-1 & App. 7-3). This area is generally represented by groundwater discharge area A on Dwg. 7-4.

The Applicant describes a preferential pathway for alluvial groundwater flow through deep coarse-grained alluvial sediments along the east side of Sink Valley, outside the proposed permit area (Chap. 7, Section 721, 728 p. 7-26). This deep water was tapped at artesian wells Y-102, Y-61, Y-59, and C5 (Fig. 13, App. 7-7). The deeper groundwater system is in communication with wells SS at the south end of the permit

area, where data from SS wells provides evidence of a 15 foot thick, highly permeable strata located 60 to 75 feet below the surface (Chap 7, Sec. 727, p. 7-27 and App. 7-1, Table 8). The application states that this coarse stratum is in contact with the artesian groundwater system found in Section 29, east of the proposed permit boundary, and that groundwater recharge to the lower half of the Sink Valley sediments occurs via horizontal migration. Artesian wells were also noted to the south of the permit area in Section 32 (Chap 7, Sec. 721, p. 7-5). This area is generally represented by groundwater discharge area B on Dwg. 7-4.

The depth of the water bearing coarse strata in well SS (App. 7-1, Table 8) corresponds with the top of the coal elevation shown on Dwg. 6-5 at the SS well location(not on drawing 6-5). Thus the coal seam, that is 200 feet below the surface at the mouth of Swapp Hollow (App. 7-1, Table 5, Well 36) may be in contact with the artesian water in surrounding wells that are screened at depths 62 to 142 feet below the surface (App. 7-1, Table 5). Alternatively, the Tropic Shale (which forms a barrier to water movement in the northern part of the permit area) thins to the south of the permit area and becomes less of an impedance to water flow between the alluvium and the coal to the south of the permit area. The application indicates that flow through the deep, coarse fragments provides better quality, water emanating from SP 32, south of the permit area (Chap. 7, Section 721, p. 7-8). The same strata would likely be responsible for the flows into Sink Valley at SP4 and SP 27 at the contact with the Dakota formation (just below the coal seam).

A small amount of flow (5 – 10 gpm) emanates in the channel at the coal seam as a spring to Robinson Creek in the northwest end of the permit area (Chap 7, Sec. 721, p. 7-6). While the coal seam is reported to have low transmissivity at Y-38 and Y-36 locations (Chap 7, Sec. 721, p. 7-4), the SS-75 well had high transmissivity (Table 7-8). Clearly the groundwater contained in this coarse stratum does not provide flow at SW 6 or SW 9 in the lower Sink Valley stream channel. These stream monitoring locations flow in response to snowmelt and precipitation events (Chap. 7, Table 4). Whether this groundwater 'daylights' downstream in lower Sink Valley should be determined.

The direction of shallow groundwater flow is shown in Figure 21 of App. 7-1. Dwg. 7-13 shows local saturation levels in the alluvium of Sink Valley, but does not represent a potentiometric surface. Alluvial ground water is present in confined piezometers at a depths of two to twenty feet within the proposed permit area (Table 1, App. 7-7 ). Unconfined water is evidenced by the numerous springs shown on Dwg. 7-1. The Applicant concluded that the distance between the monitoring wells and the perched, discontinuous nature of the saturated zones did not allow extrapolation of the potentiometric data for the entire permit area (App. 7-7, Sec. 2.6). The Applicant also concluded that an isopach map of the depth to saturation, based on the soils pits and shallow exploration bore holes, was not possible, because a continuous, saturated groundwater system was not found (App. 7-7, pp. 7- 8). The Division notes that Table 2, App. 7-7 indicates depth to ground water in soil pits was between one and six feet on the eastern side of the permit area and between four and ten feet in the center of the permit area.

Figure 8, App. 7-1 illustrates the geology in cross-section. Figure 8, App. 7-7 shows the streams, ponds, springs, and well locations in relation to surface geology, as well as the projected location of the pits and permit boundary.

The Applicant states that Kanab Creek and its tributaries are downcutting. Robinson Creek, the only continuous channel in the Sink Valley Wash area, is deeply incised and appears to be actively downcutting. The Division notes that Appendix D of the 1983 OSM AVF Guidelines acknowledges the entrenched stream courses (p.p. D-4) and states that the central question becomes, what valleys have the capability to be irrigated?" (p.D-8). The OSM AVF assessment assumes water can be "transported to any terrace level, providing that a part of that level had historically been irrigated." (p. D-8). The more important issue is water availability (p. D-9).

The information provided indicates that there is not the typical terrace and stream channel geomorphology or a defined continuous channel in Sink Valley. The application describes a locally important artesian water source that is stratigraphically above the coal seam.

#### **R645-302-321.220 Mapping of Agricultural Lands**

The application describes shallow groundwater sources that provide subirrigation east of the Sink Valley Fault within the permit area, for agricultural activity on C. Burton Pugh's and Richard L. and Alicia S. Dame's meadowlands shown on Dwg. 3-1, and immediately east of the permit area for Darlynn and Arlene Sorensen's meadowlands and pasture shown on Dwg. 3-1. In addition, Sorensen's diversion structures are in place and irrigation can be implemented in high water years immediately east of the permit area. Pugh's irrigation diversion structures are in place, but in disrepair within the permit area. Dame's irrigation structures are not shown. Johnson's irrigation ditches are not shown.

App 7-7, Sec. 4.1 through 4.3 provides a description of the agricultural use of lands within and adjacent to the permit area by cattle and for crop production. The locations of existing undeveloped rangeland, subirrigated lands, crop lands and pastures are shown on Drawing 3-1 and Drawing 7-7. There are 69 acres of meadow, 192 acres of pasture, 215 acres of sagebrush/grass land and 40 acres of oak brush, and 114 acres of pinyon /juniper in the permit area (un-numbered Table, Sec. 321.100, Chap. 3, pg. 3-3). Dry meadow acreage is described in Section 311.100, but the acreage was not calculated. The Division estimates the dry meadow acreage to be twenty acres. Meadow, pasture and oak brush are by far the most productive lands with production estimated (not measured) at between 1,100 to 2,000 lbs/acre (Table 3-34, Sec. 321.100, Chap. 3).

Grazing lands supported by numerous seeps and springs dominate the proposed permit area as shown in Chap 4, Ex. 4.1. Acreage used for pasture was not provided for Pugh or Dames lands, although one can estimate based upon the information in Section 321.100 described above that there is 261 acres of meadow and pasture. Production estimates for the meadow are 1 Ton/acre. The value of supreme to premium dairy



quality alfalfa hay would be on the order of \$130/Ton, based upon the Utah Department of Agriculture's February 27, 2009 (<http://ag.utah.gov/news/publications/reports.html>). Therefore, the value for the crop produced by 69 subirrigated meadow acres within the permit area would be \$8,970 annually. The unirrigated pasture land within the permit area has half the productivity would have a crop value of \$12,980 annually. Crop land east of the proposed permit area is illustrated on Ex. 4.1. Crop land is illustrated on Ex. 4.1 east of the proposed permit area. Acreage under production was not provided, and Ex. 4.1 has no scale, so that acreage cannot be calculated. Drawing 7-1 shows the total number of seeps and springs in the permit area available for grazing animals. Drawing 7-7 shows the ponds and ditches developed to support agriculture. Both Pugh and Dame own lands designated pastureland or subirrigated meadow lands within the permit area that have been leased to Alton Coal Development (Dwg. 3-1 and 7-7). These subirrigated lands are grazed to produce cattle, but are not cultivated to produce crops (Appendix 7-1, p. 48).

The number of cattle were not specified, although there may have been up to 750 in Pugh's herd at one time, based upon the water rights information provided in App. 7-3. Appendix 7-3 indicates that within and east of the permit area, within Sections 19, 20 and 30, Pugh holds three of eight water rights on stream reaches in Lower Robinson Creek with total allocations for 750 stock unit diversion limit. The BLM holds two additional water rights in Sec 19 and 20 that are allocated for stockwater for the Cecil Pugh grazing allotment No. 39, with a total of 26 stock unit diversion limit. Heatons have a water right just upstream of the BLM water right in Sec. 20, also for stock watering (1,600 stock unit diversion limit). Adjacent to the permit area, the BLM holds a water right in Sec 25 on Robinson Creek allocated for stockwater for Sharon Lamb grazing allotment No. 38, with a total of 18 stock units. The Lambs hold an additional water right in Sec 25 for stockwatering of 60 stock units.

Further upstream (east) from the permit area, Pugh and Sorensen also hold water rights on a reach of Right Hand Wash, in Sec 21, for 250 and 300 stock units, respectively.

Sorensen holds a water right on the stream in Sink Valley wash. Swapp and Lamb hold water rights on reaches of Kanab Creek for stockwatering, with a combined 460 stock diversion limit. The locations of these stream reach water rights are identified on Plate 7-3, Water Rights.

The Pugh lands were formerly quite productive: 700 bushels/acre of potatoes were raised with irrigation on the Pugh property in 1917 and in the 1950's oats and wheat crops were produced (personal communication with C. Burton Pugh, September 6, 2006).

East of the permit area, Darlynn Sorensen currently produces hay on 154 acres at the mouth of Swapp Hollow (Appendix 7-1, p. 48). Production from the Sorensen field varies by water year from 2,000 to 6,000 bales of hay (80 lbs each). This equates to 80 to 240 Tons of hay. The value of supreme to premium dairy quality alfalfa hay would be on the order of \$130/Ton, based upon the Utah Department of Agriculture's February 27,

2009 (<http://ag.utah.gov/news/publications/reports.html> ). At \$130/Ton, the Sorensen's annual crop value would therefore be between \$10,400 and \$31,200.

The information provided indicates that subirrigated meadow currently supports limited agricultural activity within the permit area. Meadow and croplands east of the permit area supports a larger agricultural operation.

Acreage of crop production shown on Ex. 4.1 in the adjacent area should be provided as well as mapped, along with acreage figures and mapping of the adjacent areas under production along Kanab Creek and lower Sink valley.

#### **R645-302-321.230 Mapping of Current or Historic Flood Irrigated Lands**

The Division notes that Appendix D of the 1983 OSM AVF Guidelines acknowledges the topography does not fit the typical flood plain and terrace system, but that the topography is suitable for irrigation. The topography has a gentle slope of 1 – 5% in Soil Map Unit 7 and 3 – 8% in Map Units 1 and 4 (Section 222.300 and Dwg. 2-1). The Sorensen's hold three surface diversion rights in Right Hand Wash to irrigate 104.6 acres in the W ½ of Sections 29 and 32. Sorensens hold one water right for surface diversion on Swapp Canyon Creek and four water rights for surface diversions on Sink Valley Wash for irrigation of a combined 42.4 acres in the W ½ of Sections 29 and 32. In total the Sorensens hold water rights for the irrigation of approximately 143 acres in the W ½ of Sections 29 and 32 and stockwater for 300 units.

Johnson has one surface water right on Sink Valley Wash for the irrigation of 9.0 acres and stockwater for 125 stock units.

The application acknowledges the land is suitable for flood irrigation and that lands have been historically irrigated but that water availability limits the potential for irrigation (Chap. 7, Sec. 728, p. 7-3). Irrigation has not occurred within the proposed permit area for the last 10 years (p. 48, App. 7-1), but a defunct system of water distribution does exist for the Pugh property. The Dame property is subirrigated and apparently needs no supplemental irrigation. Table 2, App. 7-7 indicates depth to groundwater in soil pits was between one and six feet on the eastern side of the permit area and between four and ten feet in the center of the permit area, allowing for subirrigation of meadows and pastures. East of the permit area, the flow from Swapp Hollow provides an average discharge of 55 gpm or an annual yield of 88.7 acre-feet (App. 7-7, Sec. 6.1.1). Flow from Swapp Hollow is retained in pond 29-1 (Dwg. 7-7).

Drawing 7-7 identifies flood irrigated and subirrigated lands, ditches that have been used for irrigation, and ponds that were probably part of irrigation systems. The Applicant states in Section 728.334, that there has been no irrigation during the past 10 years. The reason given for the decline in agricultural activity is the lack of appreciable quantities of water (App 7-7, pg. 13). Water monitoring conducted between 2005 and 2007 shows no appreciable difference from the 1987-88 data. Although, the Palmer Hydrologic Index (Figure 2, App. 7-1) does indicate that there were several years of

drought in the past decade that would have limited irrigation, the Division concludes that the decline in irrigation in the SW ¼ Sec 20 and the SE ¼ SE ¼ Sec 19 has less to do with water availability and more to do with the landowner's disinclination. During a site visit in October 2008 the Division noted pipes on Pugh lands were corroded and cracked at the collection point and disconnected along their length from holding pond 20-1. In addition, source waters from Water Canyon on USFS lands had left the stream channel and were lost in overland flow before reaching the collection point. Despite a lack of irrigation, the Division noted 35 cattle grazing subirrigated Pugh lands on October 1, 2008.

Appendix 7-7 describes the general construction and use of the water holding ponds. There are few conveyance systems between ponds; all conveyance systems in the area are indicated on Drawing 7-7. The conveyance systems consist of earthen ditches.

Stockwatering is the use stated on most of the water right printouts in Appendix 7-3, but most spring and surface-diversion rights in the W/2 of Sec. 29, E/2 of Sec 30, and W/2 of Sec. 32, T. 39 S., R. 5 W., along Sink Valley Wash around and downstream of the Swapp Ranch, either cover both stockwatering and irrigation or are for irrigation only. Ponds are used for stockwatering and irrigation systems (App. 7-7, pg. 14).

Within the proposed permit area there is one spring with a domestic water right, SP-7 (Pugh, water right 85-215), located right along the fence between Pugh's and Dame's properties (Dwg. 7-3). Adjacent to the permit area, there are two springs with a domestic water right: SP-3 (Sorensen, water right 85-373), and SP-10B (Johnson, water right 85-1011). These springs are also identified as SP-35, SP-40, and SP-33 on Dwg 7-1, as noted in deficiency R645-301-722.300 under Environmental Resources/Hydrologic Information.

Meadowlands shown on Dwg 3-1 are dominated by sedges, rushes and wild iris are subirrigated and the depth to alluvial groundwater is within "inches to a few feet below the ground surface" (App. 7-7, pg. 10). Depths to ground water in the pasturelands varies seasonally from within one or two feet to several feet below the surface (App. 7-7, pg. 12 and Table 1).

The Pugh lands were formerly irrigated using ditches, ponds, and pipes to bring water from as far as upper Robinson Creek (discussion with C. Burton Pugh in September 2005). Today, pasture lands in the permit area, dominated by introduced grass species, rely on precipitation and stored soil moisture for growth (average approximately 16 in/yr) and not on irrigation or subirrigation (App. 7-7, pg. 12). The Division notes that Dame's pasturelands may be subirrigated by the active water rights on Pond 29-3 and 29-5 (Dwg. 7-7).

Dwg 7-7 shows some flood irrigated fields owned by Sorensen. The flood irrigated and subirrigated designations are difficult to see on this drawing, since the legend for these lands is separate from the drawing legend, see deficiency under R645-301-121.200 below. Irrigation structures are shown on Dwg. 7-7. Darlynn Sorensen

currently uses flood irrigation for hay or grain production on his property at the south end of Sink Hollow Wash (Dwg. 7-7). Irrigation typically was a single flood application in the spring, when adequate water was available (App. 7-7, pg. 13). During a site visit in the fall of 2008, the Division noted that Sorensen's pond 29-1 was receiving a steady flow through the Swapp Hollow ditch and that Swapp Creek was dry as a result. The water depth in Pond 29-1 was 6 – 8 inches. In the fall of 2008 Sorensen had cultivated the slopes around Pond 29-1, increasing the acreage of cultivated land in Swapp Hollow from that currently shown on Figure 4-1. (Figure 4-1 outlines croplands; Drawing 7-7 is titled Ponds, Ditches, Subirrigated and Flood Irrigated Lands, it outlines the flood irrigated lands in red, but doesn't outline cultivated acreage.)

The Applicant has shown that the agricultural use of the land within the permit area has declined on Pugh lands. Pond 20-1 was formerly used to irrigate pasturelands in the SW  $\frac{1}{4}$  Sec 20 with water diverted from Water Canyon (several miles upstream). The applicant has shown that Pugh's subirrigated meadows in NW  $\frac{1}{4}$  Sec 29 and Dame's subirrigated meadows in the W  $\frac{1}{2}$  Sec. 29 currently support grazing.

Adjacent to the permit area, Sorensen has an active agricultural operation with lands that are subirrigated and irrigated. There are 154 acres of Sorensen's irrigated lands east of the permit area (App. 7-1, p. 48). The Applicant states that irrigation is variable depending on water availability.

West of the permit area, lands are irrigated with water taken from Kanab Creek and lower Robinson Creek (Plate 5, App. 7-7; Water Rights App. 7-3).

There is no information on agricultural activity on the Johnson owned lands that straddle Sink Valley wash, just south of the permit boundary, see deficiency under R645-301-121.200 below.

#### **R645-302-321.240 Documentation of SubIrrigation**

There are 260 acres of meadowland and pastureland within the proposed 653 acre permit area (table on p. 3.3, Chap. 3 and Dwg. 3-1). Dwg. 3-1 outlines 69 acres of meadowlands within the permit area that are dominated by sedges, rushes and wild iris and are subirrigated: the depth to alluvial groundwater is within "inches to a few feet below the ground surface" (App. 7-7, p. 10). Small acreages of meadow are located west of County Road 136 in Section 30. There are 192 acres of pasturelands within the permit area, where depth to groundwater varies seasonally from within one or two feet to several feet below the surface (App. 7-7, p. 12 and Table 1).

The locations of subirrigated lands are shown in Drawing 7-7 and described in App. 7-7, Sec 4.1. Drawing 3-1 shows meadow communities that are sub-irrigated. App. 7-7, Sec. 5.4.2 describes the meadow communities. These communities are all on the east side of the proposed permit area and they are all fed by numerous springs shown on Dwg. 7-1.

Soils in Map Unit 7 are wet. These soils are mapped on Dwg. 2-1 and their location correlates with the subirrigated lands shown on Dwg. 7-7. The July 15, 2007 infrared, aerial photo shows the moisture in Soil Map Unit #7 as red areas (Plate 4, App. 7-7). Map Units 6 and 13 have localized areas of subirrigation, including the approximately 20 acres of dry meadows shown in Plate 3-1 on the west side of County Road 136. The Applicant states that the representation of subirrigated lands on Dwg. 7-7 does not include these dry meadows that may also be subirrigated (pp. 10 and 12, App. 7-7). Depth to ground water within these meadows and pastures is provided in App. 7-7, Section 3.4, p. 10. The Applicant points out in App. 7-7, Sec. 2.6 that potentiometric data from piezometers (Table 1) does not represent shallow ground water conditions which are logged in Table 2 for the many soil pit locations shown on Figure 5 of App. 7-7. Together, Table 2 and figure 5 report that depth to water is between 50 and 120 inches in Sections 19 and 20 (T39 S, R5 W) and between 14 and 30 inches below the surface in Section 29 at the mouth of Swapp Hollow and between 60 and 80 inches in the E ½ S 1/4 of Section 30 on the southern most portion of the permit area. Depth to groundwater becomes very shallow again as one approaches Johnson Spring (shown on Dwg 7-2).

Soil mottling confirms subirrigation in plant communities (App. 7-7, Figure 10). The meadow and dry meadow plant communities grow where soils are sub-irrigated. App. 7-7 Section 5.4.4 refers to table 7 that identifies the characteristics of the meadow and dry meadow plant communities. App. 7-7 Section 6.4 states that "the topographic characteristics of most lands within the project area are compatible with flood irrigation techniques," and pasture land in the proposed permit area has the potential for subirrigation. In fact, Figure 10, App. 7-7 indicates that fine roots in all plant communities extend between 50 and 80 inches below the surface (with the exception of the very shallow pinyon/juniper community). The deepest rooted community is the Oak Brush at 80 inches. The shallowest rooted is the meadow community at 50 inches. The shallow rooting depth likely correlates to the availability of water.

### **Water Rights**

Ten springs, with a combined total flow of approximately 23 gpm are allocated through water rights as follows from App. 7-3:

Pugh holds water right 85-214 on Tater Patch Spring (SP 1) in NW ¼ NW ¼ Sec 19, flowing at 0.33 cfs for irrigation of 0.6 acres and water for 250 stock units. Pugh also holds water right 85-215 on Spring House Spring (SP-7), flowing at 0.007 cfs for domestic use and stockwatering of 250 stock units.

Dame holds four water rights on springs for irrigation of 93 acres in the NW, NE, SW, and SE quarters of Sec. 29 and water for 125 stock units [Swapp Ranch Spring No. 1 (SP 2; water right 85-350), flowing at 1 cfs; Swapp Ranch Spring No. 2 (SP 5; water right 85-351), flowing at 0.25 cfs; Swapp Ranch Spring No. 3 (SP-6; water right 85-352), flowing at 0.25 cfs; and Swapp Ranch Spring Area No. 4 (SP 8; water right 85-353), flowing at 1.0 cfs].

Sorensen has water right 85-373 on the Sorensen Ranch Spring No. 1 (SP 3), in the NE  $\frac{1}{4}$  NW  $\frac{1}{4}$  of Sec. 29, flowing at 0.011 cfs for use as domestic water and sole supply for stock watering for 300 stock units; water right 85-374 on the Sorensen Ranch Spring No. 2 (SP-4), in the SE  $\frac{1}{4}$  NW  $\frac{1}{4}$  of Sec. 29, flowing at 0.011 cfs, stock watering; and water right 85-375 on Sorensen Ranch Spring No. 3 (SP 9), in the NW  $\frac{1}{4}$  NW  $\frac{1}{4}$  Sec. 32, flowing at 0.022 cfs for stockwatering.

Johnson has water right 85-355 on Pulsifer Spring (SP 10A and SP10B) in the SW  $\frac{1}{4}$  NW  $\frac{1}{4}$  and the NW  $\frac{1}{4}$  SW  $\frac{1}{4}$  Sec. 32, flowing at 31.725 acre/ft/yr for irrigation of 4.82 and 125 stock units; and a segregated 0.9 ac/ft/yr for domestic use flowing from the same spring (SP10B).

The information provided indicates a substantial area of subirrigated meadow and potentially irrigated pastureland east of the Tropic Shale Ridge (in the proposed permit area and eastward) and to the south of the permit area on Sorensen land..

#### **R645-301-321-250 Documentation Of Water Quality and Yield, Stream Flow, Soil Characteristics, and Topography Affecting Flood Irrigation Potential**

Locations of springs and seeps identified in the Coal Hollow Project spring and seep survey are listed in Table 1 of sub-Appendix B of Appendix 7-1. Table 1 lists 33 seeps and springs, 28 of which flow from the alluvium. Drawing 7-1 and Plate 1 of sub-Appendix B of Appendix 7-1 show the springs and seeps in or immediately adjacent to the proposed permit area: 10 are within or on the proposed permit boundary. Table 3 and Figure 9 of Appendix 7-7 provide the water quality information of springs SP6 and SP8 (locations on Figure 8 of Appendix 7-7), which respectively represent the south and north subirrigated lands shown on Dwg 7-7. App 7-7 Section 5.2 compares water quality with Figure B-5 in the OSM, 1983 Alluvial Valley Floor Identification and Study Guidelines for irrigation water suitability. The spring water that is subirrigating lands in the permit area is Class 2 (medium salinity hazard, but not sodic) in the northern permit area, but degrades to Class 3 (high salinity hazard, not sodic) in the southern permit area. Stiff Diagrams on Figure 14 App. 7-1 (Peterson Report, June 12, 2007) show this change in water quality. The Division noted that water quality in the southern permit area has improved considerably between 1987-88 sampling and 2005 sampling, perhaps due to less grazing pressure or less agricultural activity?

Table 9 in App. 7-7 provides discharge and water quality data for selected surface water monitoring locations that are shown on Dwg. 7-2: Section 21 Canyon drainage (SW 7); Upper reach of Swapp Hollow (SW 8); Left Fork of Sink Valley (SW 6); (left) Dry Fork of Robinson Creek (SW 4); Lower Robinson Creek near the confluence with Kanab Creek (SW 5); Robinson Creek at the location where it is to be re-routed within the proposed permit area (SW 101); and Water Canyon (RID-1) . The Division notes that Sink Valley is monitored at SW 6, in a location that does not receive flow from the eastern canyons. The Division previously requested that Drawing 7-7 of irrigation

structures be drawn on the same scale as Dwg. 7-2, so that the point of diversion on Robinson Creek could be known in relation to the monitoring point SW 4; and so that the monitoring point for Water Canyon (RID-1) can be seen in relation to the Water Canyon diversion to the Pugh pasture, see deficiency written under R645-301-121.200.

Swapp Hollow water is medium salinity, with low sodium hazard, suitable for most plants. Swapp Hollow Creek has the best potential to support flood irrigation. The Applicant states that the average instantaneous discharge measured for Swapp Hollow Creek is 55 gpm. Calculated annual yield is 88.7 acre-feet, which would irrigate approximately 24 acres of alfalfa or 33 acres of pastureland using an earthen ditch distribution system (App. 7-7, Sec. 6.1.1 and Table 9).

Lower Robinson Creek, Dry Canyon, Section 21 drainage, Upper Water Canyon spring diversion, Sink Valley Wash, and alluvial ground water discharges have less potential to support flood irrigation. The Applicant states the flow volumes are low and inconsistent. Water Canyon spring has good quality water. Water quality of the other potential sources is not discussed, mainly because analyses are sparse due to no-flow conditions.

Pond 29-3 on Richard Dame's property is fed by groundwater from an alluvial spring. Surface water collects downstream in pond 29-5, also on the Dame property (pg. 14, Sec. 4.2, App. 7-7).

The Sorenson's flood irrigated croplands are outlined on Dwg 7-7. The Sorenson property is just east of the permit area (Dwg 1-3). App. 7-7 Sec. 4.1 relates that ponds 29-1 and 29-2, as well as the ponds 29-6, 29-4, 29-7, 29-8, 29-9 [that function as a series of overflow ponds down the Sink Valley drainage] and pond 32-1 are all on Sorenson property. Of the Sorenson's ponds, only pond 29-7 is equipped with an outlet control structure for irrigation.

A portion of the Pugh property is subirrigated, the rest was flood irrigated with a diversion Water Canyon (Dwg 7-7). Pond 20-1 is located on the Pugh property and it is equipped with an outlet control structure for irrigation (Sec. 4-2, App. 7-7). There was no water in the pond in the fall of 2008 and the supply pipe was disconnected.

The information provided indicates that the terrain is suitable for irrigation, but that irrigation is not required to produce meadowlands and pasture. When available, irrigation doubles yield. Water quality data indicate that there may be enough water to flood irrigate; that the quality of water from shallow alluvial groundwater is sufficient to raise alfalfa or other grasses for hay crops and pasture. Groundwater from the deeper portions of Sink Valley to the east in Section 32 are part of a larger, more continuous groundwater system" that is of better quality than the shallow groundwater (p. 7-8 Chapter 7.)

The volume of water to be encountered during mining is related in Chapter 7, Section 727, p. 7-21. The Applicant states that the average discharge from all springs in Groundwater Area A (shown on Dwg. 7-4) sums to 35 gpm. The average discharge from all springs in Groundwater Area B sums to 17 gpm. If mining causes material damage to all springs, 52 gpm replacement water would be required.

The application states that there could be as much as 200 gpm entering the open pit at the south end of the permit area in the vicinity of well SS (App. 7-7, p. 35 and Chap 7, Table 8). (This is the same area where the applicant has requested a variance from the six month/1,500 linear feet backfilling requirement of R645-301-553.)

### **R645-302-321-260 Analysis of Aerial Photography Showing Seasonal Difference between Valley and Upland Vegetation.**

Appendices 7-7 provides two aerial photographs of the valley floor. Plate 3 provides infrared imagery that was flown in July 15, 2006. Plate 4 provides imagery that was flown November 2, 2007. The applicant has labeled areas of wet meadow and wet pasture, and this vegetation type was described in the application. No acreages were provided. Although the imagery was referenced in the Application, there was no discussion or explanation of the infrared imagery to specify what conclusions were drawn from the comparison of the two photographs.

During the site visit on October 2, 2008, Dr. Patrick Collins and Joe Helfrich discussed the requirements of R645-302-321.260 and concluded that "an analysis of a series of aerial photographs including infrared imagery flown at a time of year to show any summer and fall differences between upland and valley floor vegetation" had been completed by the applicant (personal conversation with Dr. Collins, 10/2/2008). Although it was not specifically stated during the discussion in the field, the Division came away with the understanding that the results and conclusions of the analysis were readily available in the application and therefore the information in the application partially met the requirements of this section of the regulations. However, a discussion of the results and specific conclusions from the comparative analysis of the color infrared aerial imagery, Plates 3 and 4 still needs to be included in section 7.1 page 31 of Appendix 7-7.

Information on the ground water found in the geotechnical boreholes (Appendix 5-1) has been included in the discussion of ground water and seasonal variation in App. 7-7 (p. 7). Figure 6a and associated cross-sections provide a schematic representation of the thickness of the alluvium, stratigraphy, and depth to ground water at monitoring locations. Seasonal variation in alluvial water levels is portrayed in hydrographs in Figure 3 and on Table 1 of App. 7-7. Variation of the depth to groundwater and aquic conditions in the alluvial sediments, as observed in the soils pits, is provided in Table 2 and Figure 5 of App. 7-7. The information on groundwater depths is summarized in Figures 13 and 14 of App. 7-7.



On the average, depth to groundwater in wells east and south of the permit area is 4.5 feet and within the permit area it is 9 feet (Fig. 13, App. 7-7). Immediately east of the permit area, the head in artesian wells rises an average of 15 ft. above ground. Minimal seasonal variation in wells within the permit area and in the artesian flow is presented in Fig. 14, App. 7-7.

Groundwater wells east and south of the permit area have a seasonal variation of four feet on the average. Seasonal variation in alluvial water levels was not related to vegetation changes (App. 7-7, p. 8), but was reported to be just below the surface at the beginning of the growing season, falling to a couple feet below the surface at the end of the growing season (App. 7-7, pg. 10). Seasonal variability of springs outside of the permit area was referenced on p. 11, App. 7-7. The applicant noted no specific correlation between seasonal variations of water levels and vegetation changes.

### **Adjacent Area**

The Division is required to protect adjacent areas designated as alluvial valley floors, as per R645-302-320 and R645-302-322. Adjacent area is a defined term and means the area outside of the permit area where a resource or resources are or reasonably could be expected to be adversely impacted by the proposed coal mining and reclamation. As applied to an AVF determination, the adjacent area should include areas where there are characteristics used to evaluate the AVF and particularly areas where the hydrologic regime may be affected by the mining and consequently may affect an AVF.

Adjacent alluvial valley floor areas are shown on Figure 3 of Appendix D of the 1983 OSM Alluvial Valley Floor Determination Guideline.

The Applicant mapped the existence of probable alluvial valley floors along Kanab Creek and lower Sink valley (Plate 5, App. 7-7). The probable Kanab AVF was supported by the existence of irrigation structures, ponds and agricultural cattle production. The probable Lower Sink Valley Wash AVF designation is downstream of the historic location of flood irrigated or subirrigated areas in Swapp Hollow and Sink Valley and was designated based upon the existence of a defined stream channel.

App. 7-7, Sec. 8.0 discusses the designation of probable adjacent alluvial valley floor areas along Kanab Creek and lower Sink valley based upon visual observations and the location of irrigation diversions and pond structures. The extent of these probable alluvial valley floors has not been documented for either the Kanab or Sink Valley probable alluvial valley floors, however. Neither has an assessment of water quality or quantity been determined for the Kanab Creek probable AVF (in accordance with R645-302-322.100 and R645-302-322.200).

The December 18, 2008 application includes an outline of the adjacent area to show areas where hydrology regime may be affected by the mining. As drawn, the adjacent area includes Lower Robinson Creek, Sink Valley and the mouth of Swapp Hollow. As applied to the AVF

determination, the adjacent area map shows areas where the hydrologic impact may affect the downstream probable alluvial valley floors shown on Plate 5, App. 7-7 (Kanab Creek and lower Sink Valley).

Agricultural production in a segment of the probable Kanab Creek alluvial valley floor was described in Section 8.0 of App. 7-7 as 200 acres of pasture or hay that yields approximately 1 Tons/acre. The value of supreme to premium dairy quality alfalfa hay would be on the order of \$130/Ton, based upon the Utah Department of Agriculture's February 27, 2009 (<http://ag.utah.gov/news/publications/reports.html>). The total annual value of the Lamb hay crop would be approximately \$26,000.00. This figure does not include the \$13,000.00 value of the after-crop grazing (estimated on p. 33 of App. 7-7 to be ½ Ton/acre)

Plate 5 illustrates less than the first mile of the probable Lower Sink Valley alluvial valley floor. There is no agricultural use in the first three-quarter mile of the probable alluvial valley floor in Lower Sink Valley Wash as shown on Plate 5 and discussed in Section 8.0. However the application does not discuss downstream agricultural activity and the map does not extend for the length of the continuous stream channel in Lower Sink Valley. The Bald Knoll, Utah, USGS 7.5 minute topographic map shows the Lower Sink Valley stream channel continuing south five miles to the confluence with Kanab Creek. Sink Valley receives tributary waters approximately every mile along its way to the confluence with Kanab Creek.

#### **Findings:**

In accordance with R645-302-321.300, the Division must make a finding of the extent of any alluvial valley floors within the study area (permit and adjacent area). The Division is required to protect adjacent areas designated as alluvial valley floors, as per R645-302-320 and R645-302-322. Adjacent area is a defined term and means the area outside of the permit area where a resource or resources are or reasonably could be expected to be adversely impacted by the proposed coal mining and reclamation.

The Division has reviewed the Alluvial Valley Floor (AVF) information presented in the 2008 Coal Hollow Mine application and conclusions from this review are summarized below. The Alluvial Valley Floor determination is under review by a third party as well. There has been no final determination made at this time.

The Upper Sink Valley Wash, where the mine is proposed, consists of alluvial fan deposits, with no floodplain and terrace complex. Although some characteristics for an AVF are present, not all characteristics listed in the definitions in the Coal Mining Rules are clearly present, (see definitions for both "Alluvial Valley Floor" and "Upland Areas" in R645-100-200, i.e., unconsolidated stream-laid deposits and agricultural activity supported by irrigation and subirrigation). There is water available for subirrigation and irrigation, but the "stream" through Sink Valley Wash is not the only source of the water. Subirrigation and agricultural activity also

occurs on the edges of Sink Valley where groundwater flows through colluvial deposits from the adjacent hillsides. By definition, these conditions do not constitute an AVF.

The Applicant plans to mine in the vicinity of the springs and groundwater resource flowing through the colluvium. The stream laid deposits in Sink Valley will not be mined, however some of the ground water in the Sink Valley alluvium comes from the adjacent colluvial sediments. Any interruption of the colluvial sediments might lessen flow to the alluvial sediments, however the amount of this flow is unknown. During the field visit in October, by Division personnel, the surface flow could be seen as very small trickles into the ponds in the channel. Recharge to the alluvial sediments could also come from the deeper ground water and alluvial fans in Swapp Hollow. There appears to be no springs in the Sink Valley alluvial sediments, however there are surface water rights along Sink Valley (Drawing 7-3). The Applicant has already established a water monitoring plan for the streams and has committed to replacing any water rights that are interrupted (see also deficiency written under R645-301-720 in the Environmental Resources/Hydrology section of this Technical Analysis). Water monitoring site SW-8 is on Swapp Hollow creek and SW-9 is located at the lower end of Sink Valley.

As mining progresses to the east, a ridge of Tropic Shale will be encountered. The ridge is a mass of consolidated non-permeable rock forming the west limb of the Sink Valley trough. As mining removes the limb, it will come in contact with the colluvial sediments that transport ground water to the springs. Many of the springs, which receive their supply of groundwater through the alluvial system are likely to be impacted, because the supply will be severed. The supply may be reestablished after the coal is extracted if the mine pits are reconstructed so that the fill that once formed the limb of the trough is reformed and tightly compacted to form a hydrologic barrier. If the fractured shale cannot be adequately compacted, then an impermeable barrier may be required. The spring flow may be reestablished if colluvial sediments are backfilled. Springs may not reestablish in exactly the same place, but the supply source coming from the northeast will continue to deliver flows to the area.

The Applicant has addressed some issues, stating that mining will take place in pits that will be open no more than 120 days (Sections 724.500 and 728.310, p. 7-31). The Applicant stated that if substantial ground water flowed into the mine a study would be conducted to mitigate the flow. The Applicant was directed to show cross-sections how the mine would intercept the Sink Valley trough. Only one cross-section was provided. The Applicant will have to provide specific information on east/west cross-sections at least every 1000 foot intervals. The Applicant should show exact elevation where the mine will contact the Sink Valley trough and calculate the amount of flow expected while the pit is open. A north-south cross-section showing the gradient of the trough should be provided to show how flow migrating from north to south might be affected.

The Division requests the following information prior to making a final determination on alluvial valley floors, in accordance with:

**R645-301-121.200**, The plan states in Chap 7, p. 7-2, last paragraph, that there are no domestic supply wells within the permit area. However there may be domestic water rights on a spring within the permit area, according to the last paragraph on page 8 of App. 7-1 which states that SP-35 is used seasonally for domestic use. SP-35 is shown on Dwg 7-1 within the permit area. Please make the appropriate correction to the narrative, plate or appendix. • Please provide information on well C5 in Table 8, App. 7-1. • Instructions included with the application dated 12/18/2008 indicated that Table 7-7 was to be replaced with a new Table 7-7. However, Table 7-7 was replaced by Tables 7-7A and 7-7B on January 24, 2008. Please either re-name Table 7-7 to replace an existing table or specify the existing Table that is to be replaced by Table 7-7. • References made on p. 7-4 to cross section Y-Y' in Dwg. 6-9 and elsewhere in the application appear to be incorrect. There is a cross section X-X' on Dwg. 6-9 dated 12/24/2008, however information received on December 12, 2008 replaced Dwg. 6-9 with a new drawing that does not include a cross-section. Please verify the reference and make the appropriate corrections to the application. • The permit boundary should be shown on Plate 1 for ease of comparison with other (larger scale) plates (repeated request from Task 2910). • Crop land east of the proposed permit area is illustrated on Ex. 4.1. Acreage under production was not provided, and Ex. 4.1 has no scale, so that acreage can not be calculated. Please provide a scale on Ex. 4.1 and indicate the acreage under production for Johnson, Sorensen, Dame and Pugh lands (similar to request from Task 2910). • Dwg. 7-7 was field checked in September 2007 and several modifications should have been made to reflect the increased area under cultivation owned by Sorensen, to clarify the pond structures 29-6 through 29-9 are semi-circle dams, to place the Dame fenceline adjacent to the road, etc. • Dwg. 7-7 of irrigation structures should be drawn on the same scale as Dwg. 7-2, so that the point of diversion on Robinson Creek could be known in relation to the monitoring point SW 4; and so that the monitoring point for Water Canyon (RID-1) can be seen in relation to the Water Canyon diversion to the Pugh pasture. These relationships must be shown to confirm that monitoring accurately portrays the water supply. (repeated request from Task 2910). • Dwg. 7-7 should indicate the location of Dames irrigation structures for 93 irrigated acres and Johnson's irrigation structures for 4.82 acres. • The survey of subirrigated lands shown on Dwg. 7-7 should be extended to include all of Section 32. • The map legend for Dwg 7-7 should include the key for irrigated and subirrigated areas etc., rather than having those markings listed separately from the map legend • Make Dwg. 7-3, Water Rights, more informative by identifying the water right associated with each colored stream reach. [PB]

**R645-302-320**, Information in the MRP indicates that there are stream laid deposits in the area of the stream channel in Sink Valley, below Swapp Hollow (the center of the

SW ¼, Sec 29), east of the permit area, which are important to agriculture. The applicant will have to show that the proposed operations will not interrupt, discontinue or preclude farming on this potential alluvial valley floor in the adjacent area, and that the groundwater system in Sink Valley can be restored. The Applicant was directed to show east/west cross-sections on 1000 ft. intervals as to how the mine would intercept the Sink Valley trough, see deficiency R645-301-624, -724 and R645-301-728.100 in the Environmental Resource/Hydrology section of this Technical Analysis. [DWD]

**R645-302-321.100**, The Applicant should provide an indication of where the deep aquifer water intercepted by well SS-75 daylights downstream in lower Sink Valley. [PB]

**R645-301-321.220 and R645-301-321.200**, Appendix 7-7 and Chapter 3 provides the consultant's estimates of land productivity. Average yield data reported for high levels of management must also be provided in the environmental analysis. Current data may be available from the USDA or an appropriate state natural resource or agricultural agency. [PB]

**R645-302-321.260**, Section 5.4.4 refers to Table 7 that identifies the characteristics of the meadow and dry meadow plant communities as being conducive to sub-irrigation. Section 6.4 states, "the topographic characteristics of most lands within the project area are compatible with flood irrigation techniques." Available water rights and historical irrigation indicate flood irrigation is important to agricultural use. The application needs to include a mitigation plan for restoring water to these areas. [JH] • Plates 3 and 4 include color infrared aerial imagery taken in July of 2006 and November of 2007. Moist areas in Plate 3 appear to be gray and moist areas in Plate 4 appear to be red. To enable a comparison between plates, the presentation of these two plates should be developed with the same exposure time, such that color intensity indicating moisture is comparable. [PB, JH] • Restated from Task 2910, During the site visit on October 2, 2008, Dr. Collins and Joe Helfrich discussed the requirements of R645-302-321.260 and concluded that "an analysis of a series of aerial photographs including infrared imagery flown at a time of year to show any summer and fall differences between upland and valley floor vegetation" had been completed by the applicant (personal conversation with Patrick Collins, 10/2/2008). Although it was not specifically stated during the discussion in the field, the Division came away with the understanding that the results and conclusions of the analysis were readily available in the application and therefore the information in the application partially met the requirements of this section of the regulations. Although the Applicant utilized the aerial photos in their analysis, a discussion of the results and specific conclusions from the comparative analysis of the color infrared aerial

imagery, Plates 3 and 4, still needs to be included in Section 7.1 of Appendix 7-7.  
[JH]

## PRIME FARMLAND

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

### Analysis:

The Natural Resources Conservation Service evaluated the soils of the proposed permit area for prime farmland status in the fall of 2006. The NRCS concluded that there were no prime farmland soils in the permit area, however soils on slopes less than 14 percent could qualify as Soils of Statewide Importance, if irrigated (Appendix 2-1, Tab 6 and M:0250005\2006\Incoming\0011.pdf).

The land has historically been used for agriculture. App 7-1, p. 9, provides a description of the agricultural use of lands within and adjacent to the permit area by cattle and for crop production. The agricultural use description includes a reference to maps, Drawing 3-1 in Chapter 3 and Drawing 7-7 in Chapter 7 that show the locations of existing undeveloped rangeland, subirrigated lands, crop lands and pastures. The Applicant states that the representation of subirrigated lands on Dwg. 7-7 does not include approximately 20 acres of dry meadows shown in Plate 3-1 on the west side of County Road 136. These dry meadows may also be subirrigated (pp. 10 and 12, App. 7-7).

Both landowners, Pugh and Dame, have leased to Alton Coal Development, LLC., lands within the permit area that are designated pastureland or subirrigated meadow lands (Dwg. 3-1 and 7-7). Seven hundred (700) bushels/acre of potatoes were raised with irrigation on the Pugh property in 1917 and in the 1950's oats and wheat crops were produced (personal communication with C. Burton Pugh, September 6, 2006). How long the Pugh lands have been out of production is not known.

Within the permit area, Richard Dame's property is designated pasture land (Dwg 3-1). Dame runs cattle on his property (personal communication with Richard Dame, September 6, 2006).

Appendix 7-7, Sec. 4.1 describes irrigation and pastureland outside of the permit area.

### Findings:

The Division, in consultation with the NRCS, finds that there are no prime farmlands in the permit area.

## GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

### Analysis:

Chapters 6 and 7 address the probable hydrological consequences and requirements for geologic resource information as required by rules R645-301- 623 and 724. The Applicant compiled, evaluated and presented a description of the regional and local geology. The application contains updates to the plates depicting the geologic conditions within the proposed area. A Utah Geological Survey publication, Geologic map of Alton Quadrangle, Kane County, Utah (2001) by Terry L. Tilton is included in the MRP. The report provides a good description of the geology of Sink Valley and the adjacent hills where mining will take place. The publication contains maps and cross-sections showing the stratigraphy and structure of the area around the minesite.

Mining will take place in the Smirl coal seam. The coal zone sits at the top of the Dakota Formation and below the Tropic Shale. The Tropic shale is about 700 feet thick. The strata in the region of the mine dip toward the north and north-east from 1 to 5 degrees. In Sink Valley the lower layers of the Tropic Shale remain. It has been broken and tilted to form hills surrounding Sink Valley. The Tropic Shale consists of expansive gray and carbonaceous silty shale and claystone. Information obtained from drilling indicates that the lower 200 to 250 feet of the formation consists of fairly uniform soft, dark gray, silty shale or thinly bedded claystone with occasional thin lenses of siltstone and occasional layers of bentonite-like clay. Where streams flow on the Tropic shale, steep sided arroyos have been cut by erosion along main streams and lateral gullies. Sink Valley is filled with alluvial and colluvial material. These Quaternary deposits include pediment alluvium, landslide deposits, mass wasting debris, and alluvial fan deposits.

Appendix 7-4 contains a report by Water Engineering and Technology, Inc., (September 1988), which describes the geomorphology and sediment characteristics of Sink Valley.

Sink Valley is a broad, low area, where flowing (artesian) springs create wetlands or fens, in some areas of the valley. Plate 2 shows the surface drainages in the vicinity of Sink Valley and the proposed Coal Hollow Mine. Sink Valley Fault bisects the mine permit area from north to south. The Applicant estimates the offset of the fault is 10 to 30 feet, with the west side lower than the east side. Mining will come in contact with the fault. There is no connection between the fault and the hydrologic system. The Bald Knoll Fault runs north-south, it lies substantially east of the mine permit area and has no influence on the mine hydrology.

### Acid and Toxic Materials

The information on acid and toxic forming materials is presented in Section 623.100 and 728.320. The applicant is required R645-301-624.220 and 624.230 to collect and analyze for the potential of acid and toxic forming materials in the geological strata above, below and in the coal seam. The information is required to assess the potential for contamination of surface and groundwater by the overburden removal.

The applicant conducted a drilling program to collect cuttings and cores in 2005. Sediment, bedrock and coal samples were collected from seven locations within the project area for analysis of acid and toxic forming potential. A drill hole location map and analytic information are provided in Appendix 6-2. Samples were analyzed for texture, pH, EC, SAR, % lime, water extractable boron, total metals (including selenium), and acid base accounting. High levels of iron (>5,000 ppm) are accompanied by high pH values (> 8.6) and high SAR values (> 35) in the overburden. The overburden is not rich in carbonates and presents limited neutralization potential, with some layers containing < 50 tons calcium carbonate per kiloton of overburden. The overburden having high SAR and/or pH will have to be selectively placed to minimize the potential of salt contamination, refer to deficiency written under R645-301-731.300.

The coal seam pH values range from 5.5 to 7. The coal will be removed from the pit and stored on the surface for a limited time before being sold. Runoff from the coal storage site will be controlled and treated.

The Division received several comments that suggested coal transported from the Coal Hollow mine site could contaminate the rivers and streams if it falls along the roadside, and then is washed into the streams. The Division will forward such comments to agencies that have jurisdiction, such as the Utah Department of Transportation and to the State Highway Patrol.

One commenter suggested that the PAP should include baseline hydrologic information for the distance from the coal mine to the loadout in Cedar City. Baseline information is collected for the “**adjacent area**” that might be adversely affected by “coal mining and reclamation operations” as defined in R645-100-200. For the purposes of geologic information, the baseline must include adequate information for an alluvial valley floor determination.

**Findings:**

The application does not meet the Geologic Resource Information requirements. See requests for information made under Alluvial Valley Floor and hydrologic resources.

## **HYDROLOGIC RESOURCE INFORMATION**

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

**Analysis:**



## Sampling and Analysis

The Applicant states that water sampling and analysis have been and will be conducted according to the methodology in the current edition of "Standard Methods for the Examination of Water and Wastewater" or the methodology in 40 CFR Parts 136 and 434 (Section 723).

## Baseline Information

Petersen Hydrologic conducted a spring and seep survey in 2005 and 2006. UTM coordinates and basic parameters for identified sites are listed in Appendix B of Appendix 7-1. Locations are plotted on a USGS topographic base map in that same appendix: the area covered by the primary seep and spring survey is not identified on Drawing 7-1.

The manner in which the applicant presented baseline water monitoring information is a little confusing and takes some effort to locate all the monitoring sites and data. For instance, data for spring SP-27 has been submitted to the water monitoring database for the past three years. The SP-27 spring site is located on Drawing 7-1 but not on Figure 20 of the Peterson Report. Sorensen Spring is identified on Figure 20 of the Peterson Report, but not on any of the PAP drawings (see deficiency written under R645-301-724.100). All flow data for SP-27 report <0.1 gpm with a single measurement for specific conductance of 4,640 umhos/cm. A full laboratory analysis for SP-27 is also in the Peterson Hydrologic Report 2007.

It still isn't clear why the wells on Drawing 7-12 and on Figure 12 of Appendix 7-1 are not included in the baseline monitoring points shown on Drawing 7-2.

"722.300 Baseline monitoring stations

*Baseline monitoring stations are shown on Drawing 7- 2.* A map showing the locations of monitoring wells in the proposed Coal Hollow permit and adjacent area is presented in Drawing 7-12 and on Figure 12 of Appendix 7-1. Drawings 7-2 and 7-12 also show monitoring stations from which baseline hydrologic data were collected in previous studies. Monitoring station locations, elevations, and other details are presented in Table 7-1."

"724.100 Groundwater Information

"The location of wells and springs in the proposed Coal Hollow Mine permit and adjacent area are shown on Drawings 7-1 (Spring and seep survey map), 7-2 (Baseline monitoring locations), and 7-12 (Monitoring well location map)..."

Drawing 7-2 shows spring, stream, and well baseline monitoring location; however, Drawing 7-12 shows additional wells used to gather baseline data, and most of them were installed by the Applicant for this permit application. Is the distinction that those on Drawing 7-12 do not have water-quality data? The applicant needs to consolidate both spring and well information so it is consistent and more readily accessed. The applicant should develop a table

to show all springs, which ones are monitored, which ones have water rights, ownership, flow range, which map they are located on and how they are monitored (i.e. field and quality parameters, field parameters, flow, see deficiency written under R645-301-724.100).

The Division received a comment that baseline water quality and quantity data were not sufficient, that one or more season's data were missing for some sites, and that data have not been collected for two years. The Division's Tech-004 is cited: Tech -004 is a guideline, not a rule. Tech-004 advises one year of baseline data, adequate to describe seasonal variation, before the submission of the application. The Applicant has met this standard.

The applicant has provided a baseline groundwater monitoring plan in Chapter 7, Section 724.100 and again in Appendix 7-1 in the Peterson Hydrologic Report (PHR). An Operation and Reclamation monitoring plan is provided in Section 730, which is based on the PHC.

The Applicant has conducted baseline monitoring for surface and ground water resources on and adjacent to the proposed mine. Table 7-1 presents the location, source and use of baseline monitoring stations. Table 7-5 shows the hydrologic monitoring locations for surface and groundwater sites, and assigns the protocols for monitoring parameters and frequencies. Table 7-4 defines the monitoring protocols. Table 7-6 identifies the list of field and laboratory parameters to be monitored quarterly at surface baseline sites. Table 7-7 identifies the list of field and laboratory parameters the to be monitored quarterly at groundwater baseline sites.

Spring and stream flow data and well level information from surveys conducted in 1987 and 1988 by Utah International have been provided. The applicant has also conducted sampling between the second quarter of 2005 through the 4th quarter 2008. Some of this data is submitted in Appendix 7-1, in a 2007 hydrologic report prepared by Petersen Hydrologic, LLC. Other data has been submitted the Division's Water Quality Database. The Division conducted a review of the data.

The baseline monitoring locations identified in Table 7-1 presents the location source and use of baseline monitoring stations. Drawing 7-1 shows the locations of springs in the proposed Coal Hollow permit and adjacent area. The drawing does not show the location of wells as identified in 724.100 of the PAP. Table 7-5 shows the hydrologic monitoring locations for surface and groundwater sites, and it lists the protocols for monitoring parameters and frequencies identified in Table 7-4. Table 7-6 identifies the list of field and laboratory parameters the applicant proposed to monitor quarterly for surface baseline sites. Table 7-7 identifies the list of field and laboratory parameters the applicant proposed to monitor quarterly for groundwater baseline sites.

Drawing 7-1 shows two clusters of springs in the vicinity of the mine permit area, and associated with the alluvial plain of Sink Valley Wash, one is located on the northwest corner of Section 29 (Discharge Area A, Drawing 7-4) and the other is located on the northwest corner of Section 32 (Discharge Area B). The data shows that most of the springs within the proposed

permit boundary emit very low flows. In the northern cluster, Spring SP-16 flows about 1 gpm, whereas, springs SP-22, SP-23, SP-24, SP-25 and SP-26 flow less than 0.1 gpm. Spring SP-36 is shown on Drawing 7-1, but has not been reported to the DOGM Water Quality Database. Spring SP-14 has a flow range between 3 to 8 gpm. Springs lying just east of the mine permit area (also part of the northern cluster and Discharge Area A) consist of Springs SP-17, SP-18, SP-19 and SP-21, which flow less than 0.1 gpm. Springs SP-20 flows between 5-10 gpm and Spring SP-8 flows between 10 to 20 gpm. Only SP-8 is identified on Plate 7-2, as a baseline water monitoring station in the northern cluster. The DOGM database shows Springs SP-8, SP-16 and SP-20 have been monitored for field and laboratory parameters, although Spring SP-20 has one sample showing laboratory parameter assessment. The other springs in the northern cluster have had field parameters assessed.

The Applicant addressed deficiency R645-301-731 by stating that springs SP-8, SP-14, SP-16, SP-19, SP-20, SP-22, SP-24 and Sorensen Spring (SP-40), as well as, Springs SP-6, SP-8 and SP-33, located in Sink Valley below the proposed mine area, will be monitored for discharge and water quality during operational phase

Water quality in the northern cluster of springs is good. The pH ranges between 7 and 8. Conductivity is runs less than 800 umhos/cm in most samples, only Springs SP-24, SP-25 and SP-26 have conductivities in the 1,000 to 1,300 umhos/cm, which is still considered good. Heavy metal concentrations are very low. Calcium and magnesium constituents are a bit elevated.

Spring SP-6 is a low flowing alluvial spring located just outside the southern boundary of the mine permit area. SP-6 is not on Drawing 7-1, but is on Drawing 7-2. It has been monitored during several quarters during 2005, 2006 and 2007. Water quality analysis were collected and analyzed during the last three years. The water quality of SP-6 is similar to the water quality of the northern cluster springs.

The southern cluster of springs lies just south of SP-6. Springs SP-27, SP-28, SP-29 SP-30, SP-32, and SP-33. Spring SP-33 is the only spring in the cluster to be monitored for water quality and field parameters. Quarterly reporting of field and laboratory parameters was submitted to the DOGM database for the past three years for SP-33. The other springs in the cluster were monitored for field parameters. All of the springs in the cluster except Spring-33 have very low flows, which range less than 0.1 gpm. Spring 33 flows between 4 and 13 gpm. Compared to the northern cluster of springs, the springs in the southern cluster have higher pH values (from 7.35 to 9.1), accompanied by higher levels of total dissolved solids and specific conductance, reflecting the higher levels of sodium, potassium and calcium the water has picked up as it migrates down the valley. The levels of heavy metals do not increase substantially.

The Applicant describes 11 surface-water baseline monitoring points in Section 724.200.

*Kanab Creek drainage*

- SW-1 Kanab Creek near Alton, Utah; above proposed mining areas,
- SW-2 Kanab Creek below Lower Robinson Creek and below proposed mining areas, and
- SW-3 Kanab Creek above proposed mining areas.

*Lower Robinson Creek drainage*

- SW-4 Robinson Creek above proposed mining areas)
- SW-5 Lower Robinson Creek below proposed mining areas, and.
- SW-101 Lower Robinson Creek near proposed mining areas.

*Sink Valley Wash drainage*

- SW-6 headwaters of unnamed tributary to lower Sink Valley Wash,
- SW-7 unnamed drainage in Section 21, T39S, R5W,
- SW-8 Swapp Hollow above proposed mining areas,
- SW-9 Sink Valley Wash below proposed mining areas, and
- RID-1 irrigation diversion of water from Water Canyon drainage above proposed mining areas.

The Applicant has also monitored surface water at Lamb Canal adjacent to Kanab Creek and at SW-10, on an unnamed tributary to Sink Valley Wash. In the cover letter for the December 2008 submittal, the Applicant stated that "Surface-water baseline monitoring sites SW-10, BLM-1, and Lamb Canal were added to the description in Section 724.200", but no such information has been added to that section of the plan.

The following table summarizes what is in the Division's electronic database for the 11 sites listed above, plus SW-10, BLM-1, and Lamb Canal: Table 4 of Appendix 7-1 also contains discharge and water quality data for these sites (except BLM-1) and discharges for most are plotted in Figure 13 of Appendix 7-1. Although data are missing for some quarters at certain sites, the data are sufficient to determine seasonal variation in quality and quantity, and data collection is ongoing.

## ENVIRONMENTAL RESOURCE INFORMATION

F - field parameters only; B - baseline parameters; NA - no access; NF - no flow														
Qtr.	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-101	RID-1	Lambs Canal	BLM-1	SW-10
1-87														
2-87		F												
3-87	F	F	F			F	F	F						F
4-87	F	F	F	F	F	F	F	F	F					F
1-88	F	F	F	F	F	F	F	F	F					F
1-89														F
2-05	B	B	B	B	B			B	NF	B				
2-05												F		NF
3-05	B	B	B		NF	NF		B	NF	NF		F		NF
4-05	B	B	B	NF			NF	B	NF	NF	B	NF		NF
1-06	B	NA	B			B			B	B		NA		NF
2-06	B	B	B	NF	B	NF		B	NF	NF	B	F		NF
3-06	B	B	B	NF	B	NF	NF	B	NF		B	NF		NF
4-06	B		B	NF	NF	NF	NF	B	NF	NF	B			NF
1-07	B	B	B	NF	NF	NF	NF	B	NF		B	F	F	NF
2-07				NF	NF	NF	NF		NF	NF		F	F	NF
3-07	B	B		NF		NF	NF	B	NF	NF	B	F	F	NF
4-07	B	NA	B	NF	NF	NF	NF	B	NF	NF	NF			NF
1-08		NA	B	NA	NA	B		NA	B	NF	NA		NA	F
2-08	B	B	B	NF	B	NF	NF	B	NF	NF	B	F		NF
3-08	B	B	B	NF	B	NF	NF	B	NF	NF	B	NF	F	NF
4-08	NA	NA	NA	NA	NA	NF	NA	NA	NF	NF	NA	NA	NA	NF

## Wells

The applicant discusses the use of wells to assess groundwater conditions in Section 724.100. The Applicant initiated a drilling program in the second quarter of 2005, which included 30 monitoring wells on and adjacent to the permit area. Investigative methods and results of the analysis of the data are described in Appendix 7-1. The information Table 7-4 gives a list of baseline monitoring wells, Y-36, Y-38 Y-45, Y-59, Y-61, Y-63, Y-99(A2), and Y-102(A5).

Drawing 7-12 shows the well locations for coal monitoring (boreholes) and alluvial monitoring wells. Drawing 7-13 shows the potentiometric levels of groundwater from water levels in the wells. Table 7-2 provides the monitoring well details (collar elevation, depth, depth to bedrock and screened interval. It is unclear in the table if the depth is from the top of the collar or surface, see deficiency written under R645-301-724.100.

The applicant provides graphs of water elevations in wells Y-36, Y-38, Y-59, Y-63, Y-98 and Y-102. There is not a graph for Y-61, however there is some discharge data in the DOGM database. The data shows Y-61 is an artesian well

Several boreholes encountered water at depths of approximately 10 – 15 feet, and flowing sands were found at 15 to 25 feet. The subsurface investigation was done during a period of high snowmelt; seasonal fluctuations of water levels of several feet are not uncommon (Appendix 5-1, Section 4.3). Drill logs, by Petersen Hydraulic and Taylor Geo-Engineering, are in Appendix B of Appendix 5-1. Geotechnical data from the boreholes are in Appendices C-1 and C-2 of Appendix 5-1. Drilling and sample locations are shown on Drawing 5-39.

The well monitoring data has provided the applicant with the information to evaluate the groundwater regime. Drilling programs identified the depth of coal, identify overlying strata and establish the level of groundwater or piezometric surface of groundwater, Drawing 7-13. Table 10, Appendix 1 identifies two wells as having artesian flow in Sink Valley, Y-61 and C5-130, in alluvial ground water system east of the permit area (Dwg. 7-12 and 7-13, Table 1 and Table 5 in Appendix 7-1). Assessment of data from wells Y-61 and Y-102 indicates groundwater quality in Sink Valley is of good quality and plentiful. The seasonal variation of water quality is established for these two wells. These reflect the groundwater moving through Sink Valley from Water Canyon, Section 21 drainage, and Swapp Canyon drainage. The applicant conducted a drawdown and recovery test on Well Y-61. The pumping rate was 334 gpm. Both springs (SP-20, SP-8, SP-14) and wells (C2-40, C3-40, C4-30 and SS-30) were monitored for drawdown. Figures 17 and 18 in show graphs over the elapsed time of pumping.

Mining in the lower part of Section 30 will also destroy wells Y-102, C2, C7, C8, and C9, which lie within the Sink Valley groundwater trough. Groundwater monitoring should be established in the lower part of sink valley to monitor water quality changes during operational and reclamation phases.

Holes have been drilled on the west side of the drainage divide LR, LR45 CO, C6, Y49 and Y50. Well C6 was dry during four quarters in 2007. Wells CO, Y49, Y50 were monitored, but no seasonal water quality was collected. Water level data has been provided for several boreholes during the quarters of 2007 and first quarter of 2008. There is very little water quality data from wells on the Robinson Creek side of the drainage divide Figure 19, Appendix 7-1. Alluvial sediments are shallower in the Robinson side of the permit and the well information shows lower water levels. Mining in this area will destroy most of the wells.

Although there is only a small amount of monitoring information on the west side of the permit area, the applicant has established the hydrologic regime in that part of the permit area Figures 21 and Drawing 7-13. The groundwater drainage divide created by the fault and dip of the beds have isolated the west and northern portion of the mine permit from the recharge areas to the west.

The piezometric surface was derived with a paucity of well data on the west and north side of the permit. The method used to derive the piezometric surface must be described.

The Applicant has identified that, in and adjacent to the proposed permit area, groundwater resources in the Tropic Shale and Dakota Formation are limited, and neither is a significant source of ground water. Information supporting this conclusion is found in Section 721. Chapter 6 and Appendix 7-1 contain information on the lithology and stratigraphy of the Tropic and Dakota strata. Bore-hole logs in Appendix 6-4 indicate strata overlying and immediately underlying the Smirl Coal do not possess aquifer characteristics.

In the proposed permit and adjacent area, Tropic Shale and Dakota Formation provide no baseflow to streams or water from wells. The Applicant has identified one small spring (SP-4; average flow ~1 gpm) that flows from a fault zone in the Dakota and seeps SP-27 (also known as Clampett Spring) and SP-34 that flow from the Dakota Formation in the area just south of the proposed mine (Drawing 7-1). There are no wells in the proposed permit and adjacent area that produce water from the Tropic Shale or Dakota Formation. Mining of the Smirl Coal, at the Tropic – Dakota interface, is not expected to intercept significant volumes of water from these strata nor adversely impact any aquifer below the coal.

The Applicant states that the Dakota Formation is not a good aquifer. Vertical and horizontal ground-water flow in the Dakota Formation is impeded by the presence of low-permeability shales that encase the interbedded, lenticular sandstone strata in the formation, and the natural flow of ground water through the formation is meager, with only minor discharge from the Dakota to springs or streams in the surrounding area. The Tropic Shale that overlies the Dakota limits vertical recharge (Section 624.100; Groundwater).

Slug tests on wells screened in the Smirl Coal Seam indicate relatively low hydraulic conductivity values (Table 7-8). In much of the proposed mining area, the coal seam has been found to be dry. Neither large inflows of ground water from the coal seam into mine workings from the Dakota Formation nor seepage out of mine pits through the coal seam is expected.

The Division received a comment that the boreholes did not extend to the aquifers in the Dakota Formation. The commenter did not identify aquifers or present evidence of aquifers in the Dakota Formation. Neither the Division nor the Applicant has found evidence of aquifers in the strata beneath the Smirl Coal Seam that may be adversely impacted by mining. Borehole logs in Appendix 6-4 contain representative drill-hole logs depicting the nature, depth and

thickness of the coal seam to be mined, rider seams in the overlying strata, and the nature of the Dakota Formation strata immediately below the coal seam to be mined, which meets the requirements of the Coal Mining Rules.

A comment was received that there is no description of the geology that includes any aquifer below the lowest coal seam to be mined, and that samples have not been collected from that aquifer. The Navajo Sandstone aquifer is a regional aquifer that provides ground water of good quality for domestic and agricultural use and to municipal wells. It provides baseflow to springs and streams, and it is the first water-bearing strata underlying the Smirl Coal Seam that can produce appreciable quantities of ground water. The Navajo Sandstone does not crop out in the proposed Coal Hollow Mine permit and adjacent area, is effectively isolated from proposed mining areas by more than 1,000 feet largely low-permeability shales and siltstones of Dakota and Carmel Formations, and is not reasonably expected to be impacted by proposed mining operations. The Navajo Sandstone is described in Sections 621, 624.100, 728.310.

The application contains geologic information in Chapter 6, Appendix 7-1, and other sections of the submittal. This information is not sufficient to assist in determining the PHC of the proposed operation on surface and ground waters in the proposed permit and adjacent areas, determining whether the required reclamation can be achieved, and whether the proposed operation has been designed to prevent material damage to the hydrologic balance in the adjacent area. The Sink Valley Fault and associated Tropic Shale ridge are important features in the surface and subsurface hydrology of Sink Valley Wash. Figure 8 of Appendix 7-7 shows the relationship of the springs, ponds, and streams to the Tropic Shale Ridge and fault and the extent of surface disturbance from excavation of the mine pits. The cross-section on Drawing 7-6 shows the relationship of the pits to the Sink Valley Fault, the Tropic Shale ridge, and the alluvium; however, it does not show the zone of saturation in the alluvium nor the potentiometric surface. To more clearly convey the importance of the Sink Valley Fault and associated Tropic Shale ridge in the relationship of the hydrologic systems to the proposed mine, the Applicant needs to show the Sink Valley Fault on several maps and cross sections, including but not limited to: Drawings 7-1, 7-4, 7-7, 5-10, 5-17, 5-18, and 5-19. To supplement Drawing 7-6, the Applicant needs to create additional cross sections that clearly show the extent of the pits – including the extent of overburden removal; the location of the fault and Tropic Shale Ridge; the location of seeps, springs, and wells; the potentiometric surface; the Alluvial Discharge Areas; and – if known - location, extent, thickness or top-elevation of the saturated zone(s) of the alluvial aquifer. These should be centered on Pit 15, where the possibility of impacting the hydrologic balance and the essential hydrologic function of the possible AVF is greatest. Cross sections should be approximately 500 feet apart and must extend beyond the Permit Boundary far enough to show the relationship of the proposed mining to hydrology of the adjacent area; at least one should extend east far enough to include the Sink Valley Wash channel.



### **Baseline Cumulative Impact Area Information**

The Division has not initiated the CHIA findings document. Information from the permit application will be used along with information from other sources in preparing the CHIA. The Applicant may be required to provide additional information.

### **Probable Hydrologic Consequences Determination**

Section 728 contains the PHC Determination, and there is also discussion in Section 724.500. A comment was received that the PHC determination was not based on baseline geologic and hydrologic information "collected for the permit application". The Division finds that there are deficiencies in some of the baseline data and therefore there are deficiencies in the Applicant's PHC determination. The following sections summarize the Applicant's PHC determination and deficiencies identified by the Division.

Potential Adverse Impacts to the Hydrologic Balance (728.310) The application states that information from drilling and aquifer tests indicates that large inflows to the mine pit are not expected; if such inflows develop as mining progresses, the Applicant commits to use techniques such as bentonite- or clay-filled cutoff walls to minimize inflows. Temporary reductions in flow from alluvial aquifers may occur but are likely to be short-lived as the pits will remain open for only 60 to 120 days.

The Division analyzed surface and groundwater data from the database and PAP to determine whether sufficient monitoring information was available to assess the hydrologic regimes, establish seasonal variation, and the potential adverse impacts to the hydrologic balance for the PHC, the Division does not find the data sufficient, see deficiencies written below.

### **Direct Interception of [Regional] Ground-water Resources**

The Applicant has identified that ground-water resources in the Tropic Shale and Dakota Formation are limited and neither the Tropic Shale nor Dakota Formation is a significant source of ground water. Information supporting this conclusion is found in Section 721. Chapter 6 and Appendix 7-1 contain information on the lithology and stratigraphy of the Tropic and Dakota strata. Bore-hole logs in Appendix 6-4 indicate strata overlying and immediately underlying the Smirl Coal do not possess aquifer characteristics. In the proposed permit and adjacent area, these strata provide no baseflow to streams or water from wells. The Applicant has identified one small spring (SP-4; average flow ~1 gpm) and seeps SP-27 (also known as Clampett Spring) and SP-34 that flow from the Dakota Formation in the area just south of the proposed mine (Drawing 7-1). There are no wells in the proposed permit and adjacent area that produce water from the Tropic Shale or Dakota Formation. Mining of the Smirl Coal, at the Tropic – Dakota interface, is not expected to intercept significant volumes of water from these strata nor adversely impact any aquifer below the coal.

A comment was received that there were no contour maps or cross sections depicting seasonal difference in head for aquifers in the Dakota Formation, that there are no water monitoring wells in the Dakota Formation, and that there is no description of the geology that includes any aquifer below the lowest coal seam to be mined. The commenter did not identify an aquifer in the Dakota strata, and neither the Applicant nor the Division has seen any indication of an aquifer or other significant subsurface water resource in the Dakota or Tropic Shale strata, in and adjacent to the coal seam to be mined, that would warrant requiring the mentioned maps and cross sections or requiring the Applicant to install monitoring wells in the Dakota Formation.

The Navajo Sandstone aquifer is a regional aquifer that provides ground water of good quality for domestic and agricultural use and to municipal wells. It provides baseflow to springs and streams and is the first water-bearing stratum underlying the Smirl Coal Seam that can produce appreciable quantities of ground water. It is described in Sections 621, 624.100, 728.310.

The Applicant provides Plate 2 and Figure 19 (App. 7-1) showing the surface water drainages. Three major drainages appear in the vicinity of the mine: The upper Kanab Creek Drainage, the Sink Valley Drainage and Johnson Wash Drainage. Runoff from Water Canyon, Dry Fork and Lower Robinson Creek drain across the northwest side of the mine permit area. Section 21 Canyon and Swapp Hollow are the recharge source for Sink Valley. The bulk of the groundwater fluxes through the area on the eastern side of the mine. Sink Valley is made up of coarse grained alluvial and colluvial sediments that transmit the groundwater. Maps of the Sink Valley Drainage, as shown in Figure 21, Appendix 7-1 Drawing 7-4 shows two major locations of alluvial groundwater discharge areas east and southeast of the mine permit area. Figure 7-13 shows the potentiometric level of groundwater in the alluvial/Sink Valley area. In this same map the applicant shows the approximate location of the alluvial groundwater divide between Sink Valley and Lower Robinson Creek drainage.

The coal recovery area is shown on Drawing 5-14. The recovery area follows the approximate location of the fault on the east side of the permit. The drawing shows the coal thickness ranges from 7 feet to the west to 18 feet on the east side of the permit area. Overburden thickness in the coal recovery area ranges from zero to about 200 feet on the east side of the permit boundary near the fault. Most of the coal in the recovery area lies below 140 feet. Drawing 5-16 shows the sequence of mining and extent of the surface disturbance from mine pit development. Plate 5-12 shows the typical cross-section of the mine pit.

The Division received comments that groundwater will be depleted and contaminated when mining takes place. The Division has evaluated the PAP for potential impacts mining will have on the groundwater systems of Lower Robinson Creek and Sink Valley wash.

The first year of mine development will take place in the Robinson Creek drainage. It is expected that the mine will encounter only minor amounts of ground water in the colluvial

deposits above the permit area and groundwater trapped in the coal zone. The second and third years will see Pit 2 and Pit 3 developed in the eastern part of the permit. As the mine progresses westward the bottom of the pit will not extend all the way to the permit boundary, but stop at a point where the pit walls, angled at about a 2:1 slope, will extend from the pit floor to the permit boundary. When the pit walls are excavated on the east, mining will mine through the west side of the alluvial trough (Petersen Hydrologic Report Figures 6d, 6e, and 6f Petersen report). This alluvial trough holds and channels groundwater from the drainages to the lower basin of Sink Valley. These cross-sections should be extended westward to include the mine pit, such that an idea of the elevation of the cut and the lowering of the gradient of the groundwater in Sink Valley could be ascertained. The applicant must supply cross-sections, that depict the mine pit, and Sink Valley trough, and show the expected change to the groundwater head as a result of mining. The applicant should discuss how the pit will be reclaimed to restore the groundwater level in Sink Valley.

The information supplied indicates the Sink Valley aquifer may be drawn down substantially. As an example, if one looks at cross-section D-D' in Figure 6e, Petersen Hydrologic Report, December 15, 2008) and imposes the mine pit in relation to the cross-section. The mine pit is expected to be about 110 feet in the area of Well C-3, Drawing 5-15. The mine pit wall angle is about a 2:1 slope, Drawing 5-12. That puts the bottom of the pit 220 feet from the mine permit boundary. As mining removes the western edge of the trough that holds the aquifer, flow from the aquifer will enter the mine. Rough estimates near Well C-3 show the aquifer could be lowered 30 feet, which equates to a large volume of water. When one considers that the Sink Valley aquifer will be mined into almost a mile, groundwater interception could be substantial if the replacement material does not seal the aquifer.

The recharge source from the east works in favor of still supplying the aquifer. The Division suggests the applicant consider alternatives such as installing wells along the east side of the permit area and pump groundwater back to Sink Valley, to the channel where some flows can be used. It will eliminate flow to the pit where it can become more contaminated. It will also eliminate pumping to Kanab Creek via Robinson Creek.

### **Diminution of Downgradient Ground-water Resources**

The Applicant has identified that neither the Tropic Shale nor Dakota Sandstone are a significant source of ground water. In the proposed permit and adjacent area, the Dakota Sandstone supports flow from one small fault-related spring and a few seeps that have no associated water rights.

The applicant has not submitted sufficient information to show the hydrologic balance will be maintained. Geologic information identifies a hydrologic barrier between the Sink Valley aquifer and the proposed mine pit. Information presented in the Petersen Hydrologic Report Figures 6d, 6e, and 6f shows the level of groundwater at different monitoring sites in Sink Valley. Mining of the pit will remove some of the barrier that contains the groundwater in Sink

Valley. Extending the cross-sections westward to include the mine pit will allow the reviewer to see the reduction of the hydrologic barrier and potential change of the groundwater level.

### **Draining of Upgradient Ground-water Resources**

Based on information from water monitoring wells, including slug tests and a pumping and recovery test of Y-61, and analysis of the geology and hydrology of the proposed permit and adjacent area, the Applicant has concluded that the proposed mine plan is designed to minimize potential diminution of flow from the alluvial springs in the proposed permit and adjacent area.

The Applicant notes that after the pump Y-61 was stopped at the end of the 28-hour pumping test, spring discharge rates and water levels in alluvial monitoring wells recovered to approximate pre-test levels. Figure 18 in Appendix 7-1 shows the drawdown and recovery response of four wells (C2-40, C3-40, C4-30, and SS-30) and three springs (SP-20, SP-8, and SP-14). The observation springs were 750 to 1,400 and the wells 1,800 to 4,400 feet from the pumping well. Drawing 7-14 illustrates the drawdown at C2-40 and two other wells, Y-102 and Y-59, which were within 1,000 of Y-61; the Applicant states that drawdowns at more distant wells are too small to show at the scale on this drawing. The Applicant needs to provide a map – or set of maps – illustrating the size and shape of the cone of depression from this pump-drawdown test.x

The relationship of the alluvial ground-water table to wells and springs in and adjacent to the NW1/4 of Sec 29 is crucial in understanding the PHC of the proposed mining operation. Figure 18 in Appendix 7-1 indicates that during the pump test on Y-61, water levels actually increased at SP-8 and SS-30 and flow increased at C2-40 after 4 hours of pumping..

If inflows to the mine pits become excessive as mining progresses, the Applicant commits to use techniques such as bentonite- or clay-filled cutoff walls to minimize inflows. Temporary reductions in flow from alluvial aquifers may occur but are likely to be short-lived as the pits will remain open for only 60 to 120 days.

Water replacement is discussed in Section 727. Long-term diminution of flow will be replaced with water from a well that has not been drilled yet. The town of Alton has entered into an agreement to transfer a point of diversion for water rights to 50 acre-feet of water, which the Applicant plans to use to satisfy the water replacement requirements: a copy of the agreement with the town of Alton is in Appendix 7-8. The planned new water well will be constructed on lands currently leased by Alton Coal Development, LLC. It is not clear if this will be the water-supply for the mine or for water-replacement only. The Applicant must clarify that this well will be completed prior to mining east of the Tropic Shale Ridge.

### **Acid and Toxic-forming Materials (728.320)**

Appendix 6-2 contains information on the acid- and toxic-forming potential of earth materials naturally present in the proposed permit and adjacent areas. Appendix 6-1 (confidential binder) has information on the Smirl Coal Seam that is proposed for mining. Geochemical data indicate the potential for AMD and toxic drainage is low. Acid- or toxic-forming materials do not appear to be present in the proposed permit and adjacent area in amounts that create a concern, as discussed in Section 728.332. The composite neutralization potential of the overburden and underburden is 180 tons per kiloton, which is almost 33 times the acid potential of 5.5 tons per kiloton, indicating a strong likelihood that acid-mine drainage will not be an issue at the Coal Hollow Mine.

Materials with poor quality SAR, elevated selenium or boron concentrations, or poor pH will not be placed in the upper 4 feet of the reclaimed surface (Chapter 2). See also, selenium monitoring discussion under Operations/Hydrology and deficiency written under R645-301-731.300.

### **Impacts to Important Water-quality Parameters (728.332)**

The Applicant does not anticipate discharge of waters from the Tropic Shale or Dakota sandstone. The plan calls for limiting inflow of alluvial waters into the pits, reducing the potential for contamination, mainly from increased TDS concentrations.

In Section 728.333, the Applicant outlines special measures to be taken when mining nears the eastern edge of Pits 13-15, where there is the greatest chance of intercepting large quantities of ground water from the alluvial artesian ground-water system in the NW ¼ of Section 29, T. 5 W., R. 39 S. These measures can minimize the potential for ground-water inflows and deal with them if they occur.

The Applicant anticipates that water will not be discharged from the mine pits. Water in mine pits interferes with the surface mining technique, so keeping water out of the pits is a priority of mine operation. The only likely, foreseeable source of appreciable quantities of ground water is from the alluvial ground-water systems overlying the Tropic Shale. Where possible, ground water encountered in alluvial sediments along the margins of mine pit areas will, as a temporary measure, be intercepted, drained through pipes, ditches or other conveyance methods away from mining areas (Section 728.332, p. 7-35).

The Applicant states that excavation of the alluvial sediments at the eastern edge of the permit boundary in Pits 13, 14, and 15 will proceed incrementally and with caution. If coarse, water-bearing alluvial sediments are encountered, the equipment operators will stop overburden removal and cover the exposed gravels with available impermeable alluvial material (Tropic Shale) to, if possible, halt ground-water inflow. A hydrogeologist will be called to the site to assess the conditions (Section 728.333, p. 7-28). Prior to the resumption of overburden removal,

the Applicant will develop a suitable work plan, designed to minimize the potential for intercepting unacceptably large inflows of ground water into the mine pits. The work plan may include such measures as trenching and emplacement of a low-permeability cut-off wall to isolate the mine openings from the coarse-grained alluvial ground-water system, with the object of minimizing the potential for detrimental impacts to the hydrologic balance and the potential for flooding of mine pits and causing flooding or stream alteration through the discharge of large volumes of water.

The Applicant states that where possible, ground water encountered in alluvial sediments along the margins of mine pit areas will, as a temporary measure, be intercepted, drained through pipes, ditches or other conveyance methods away from mining areas (Section 728.332, p. 7-35). This will prevent or minimize the potential for interaction with sediments disturbed by mining operations, including contact with the mined coal seam. These intercepted alluvial ground waters would be routed into Pond 4, which has a storage capacity of 7.5 acre-ft, 1.8 acre-ft more than required, and an emergency discharge structure (Section 728.333). Design parameters for Pond 4 are in Appendix 5-2. The Applicant does not have a UPDES permit, but commits that any discharges from the mine will be done under a UPDES permit (Section 728.333).

Sedimentation ponds and other sediment control methods will minimize erosion from disturbed areas and control or prevent additional contributions of suspended solids to stream flow or runoff outside the permit area.

The Applicant commits to using spill control kits on all equipment to minimize contamination from spillage of hydrocarbons, and that the site will have a SPCC plan (Section 728.322).

The Applicant states that as ground water migrates through the shallow, fine-grained alluvial sediments in the proposed Coal Hollow Mine permit and adjacent area (most notably in Sink Valley), the quality of the water is naturally degraded: Appendix 7-1 is referenced for this information. Drawing 7-5 shows that specific conductance of the water increases downgradient. Stiff diagrams for selected springs, shown on Figure 14 of Appendix 7-1, indicate a downgradient evolution from calcium-magnesium-bicarbonate type waters toward waters with greater portions of sodium, potassium, magnesium, and sulfate and increased TDS.

The application states that pumping and discharging of mine water from mine pits at the proposed Coal Hollow Mine permit area is not anticipated. The Applicant does not anticipate water entering the pit from adjacent strata, but this may prove to be incorrect. Flooding of pit mines by heavy precipitation is a known occurrence and a real possibility at the Coal Hollow Mine, as the Applicant states in Section 728.333:

*“The anticipated discharge rates from alluvial ground-water drainage and the maximum reasonably foreseeable amount of mine discharge water that could potentially be*

*required to be discharged from mine pits is much less than that periodically occurring during major torrential precipitation events."*

In Section 728.333, the Applicant outlines special measures to be taken when mining nears the eastern edge of Pits 13-15, where there is the greatest chance of intercepting large quantities of ground water from the alluvial artesian ground-water system in the NW ¼ of Section 29, T. 5 W., R. 39 S. These measures can minimize the potential for ground-water inflows and deal with them if they occur.

If excessive quantities of water, from any source, were to flow into the pits, the Applicant commits that water is to be pumped from the pits using suitable equipment that will be kept on-site. The water will be managed in compliance with applicable State and federal regulations. The Applicant emphasizes that flooding of the pit would hinder mine operations and it will be in their best interest to take all reasonable efforts to minimize the potential for flooding of the mine pits (Section 728.333).

#### **Flooding or Streamflow Alteration (728.333)**

The Applicant asserts in Section 728.333 that the reasonably foreseeable mine discharge of several hundred gpm and the maximum anticipated alluvial ground-water discharge to Sink Valley Wash or Lower Robinson Creek are much less than the flows occurring periodically in those drainages during torrential precipitation events, and will likely not be sufficient to potentially cause flooding or stream flow alteration in either drainage. The addition of modest amounts of sediment-free water into these stream channels has the potential to cause minor increases in channel erosion; however, the magnitude of this potential impact will likely be small relative to the erosion and sedimentation occurring during torrential precipitation events.

Based on the estimated mine pit ground-water inflow rates in Table 7-9, the Applicant considers it likely that mine interception will be on the order of a few tens of gpm (dry areas; small pit size) to several hundred gpm (wetter areas; large pit size). In most instances, individual mine pits in will remain open for no more than about 60 to 120 days, minimizing inflow (Sections 724.500 and 728.310, p. 7-31). (The Application is not clear whether this timeframe is post mining or whether the timeframe includes mining and reclamation, see deficiency written under R645-301-728 and -121.200.)

The Applicant states in Section 728.333 that lower Sink Valley Wash (below the County Road 136 crossing), Lower Robinson Creek, and Kanab Creek have large discharge capacities and periodically convey large volumes of runoff: The Division's database contains flow data from these streams back to 1987. The data show that, although Kanab Creek, Sink Valley Wash, and Robinson Creek are typically dry, flows of several hundred gpm - and on occasion thousands of gpm - occur periodically. The maximum flow reported for Kanab Creek is 6,283 (14 cfs) at SW-2 (above the confluence with Lower Robinson Creek) on 2/11/1988; a more recent high flow

of 4,170 gpm (9 cfs) occurred on Kanab Creek at SW-3 (below the confluence with Lower Robinson Creek) on 03/22/2008.

The Applicant finds it noteworthy that the principle surface drainages in and adjacent to the proposed Coal Hollow Mine permit area, i.e., Lower Robinson and Kanab Creeks and their tributaries, are in many locations not stable in their current configurations, and are actively eroding their channels during precipitation events. This results in down-cutting and entrenchment of stream channels, the formation of unstable near-vertical erosional escarpments adjacent to stream channels that occasionally spall off into the stream channel, aggressive headward erosion of stream channels and side tributaries, and the transport of large quantities of sediment associated with torrential precipitation events. These processes appear to be migrating upstream, resulting in increasing lengths of unstable stream channels. The Applicant cites researchers who propose that although the creation of the numerous arroyos currently in existence in the southwestern United States is not completely understood, the effect may have been magnified by the temporal coincidence of several factors: 1) valley fill alluviation in the southern Colorado Plateau occurred during a long-term decrease in the frequency of large, destructive floods, which ended in about 1880 with the beginning of the historic arroyo cutting; 2) the shift from deposition to valley entrenchment coincided with the beginning of an episode of the largest floods in the preceding 400-500 years, which was probably caused by an increased recurrence and intensity of flood-producing El Nino Southern Oscillation events beginning around 1870; 3) land-use practices such as livestock grazing, and 4) natural cycles of erosion and deposition caused by internal adjustments to the channel system. The Applicant cites historical evidence that the cutting of Kanab Creek began with a large storm on 29 July 1883, followed by unusually large amounts of precipitation in 1884-85, and that during this period, the Kanab Creek channel was down-cut by 60 feet and widened by 70 feet over a distance of about 15 miles: the lowering of Kanab Creek may have resulted in a lowering of the local base level and consequent incision of both Sink Valley Wash and Lower Robinson Creek. Heavy livestock grazing likely contributed to the stream down-cutting episode in the late 1800s. The Applicant proposes that the Coal Hollow Mine MRP is designed to minimize the potential for sediment yield and erosion and consequently for stream channel erosion and instability; no mining-related activities are planned that would likely increase current instability of the surface water drainages in the permit and adjacent area (Section 728.333).

The application states in Section 728.333 that most precipitation runoff on disturbed areas will be contained in diversion ditches and routed to sedimentation impoundments. Sediment control facilities will be geotechnically stable, minimizing the potential for breaches, which can result in down-stream flooding and increased erosion and sediment yield. Emergency spillways will provide a non-destructive discharge route from the impoundments, if needed.

In the proposed mining plan, Lower Robinson Creek is to be diverted temporarily. Appendix 5-3, prepared by Dr. James E. Nelson, Assistant Professor, Civil and Environmental Engineering at BYU, contains the analysis and specifications for this diversion, and Drawings 5-20 and 5-21A show design details for the construction and reclamation of this channel. The



resulting temporary channel will have straight reaches and three sharp bends - including two 90° bends - and will require extensive rip-rap. The reclaimed channel will be in approximately the same location as the current channel; however, instead of restoring the channel to its current configuration, with an entrenched channel and steep embankments, the Applicant proposes a sinuous channel, flanked by a narrow flood plain, with banks laid back at a more gentle angle.

#### **Ground Water and Surface Water Availability (728.334)**

Water rights are shown on Drawing 7-3 and listed in Appendix 7-3. (The spring designations on Drawing 7-3 do not match those on other maps; the Applicant has been asked to rectify this confusing discrepancy, see R645-301-121.200 and R645-301-720). Domestic water for the Swapp and Sorenson Ranches comes from alluvial springs. Spring SP-8 (water right 85-363) supplies the Swapp Ranch, but the water right doesn't designate domestic use. Sorensen's water right 85-373 (SP-3) is for both stockwatering and domestic use. Pugh's water right 85-215 (SP-7) is located right along the fence between Pugh's and Dame's properties and is the only domestic water right within the proposed permit area. Spring SP-10B (water right 85-1011), south of the proposed permit area, supplies domestic water for the Johnson family.

Alluvial springs have provided limited irrigation water for home gardens and fruit trees in areas adjacent to the proposed Coal Hollow Mine permit area (Drawing 7-7), but other than some current yard irrigation at the Swapp Ranch house, these lands have not been irrigated for over 10 years (Personal communication, Burton Pugh, 2008; Richard Dame, 2007). The Pughs and Dames own both the coal that will be mined and the overlying surface, as shown on Drawings 1-3 and 1-4.

Mr. Sorensen has used runoff from the adjacent Paunsaugunt Plateau for flood irrigation for hay or grain on lands east of the proposed Coal Hollow permit area (Chapter 4, Exhibit 4-1 and Drawings 1-3, 1-5, 1-6, and 3-1). Based on personal communication between Mr. Sorensen and the Applicant, this irrigation typically has been a single application in the spring and is largely limited to years with appreciable precipitation and stream runoff: with the exception of 2005, water has not been sufficient for flood irrigation in recent years. Source areas for these waters are topographically and stratigraphically upgradient of and distant from the proposed Coal Hollow Mine, and surface- and ground waters from these areas will not be impacted by the proposed mining activities (Section 721; Appendix 7-7, Section 4.1).

The Applicant estimates State appropriated water supplies to be approximately 35 gpm in Alluvial Groundwater Discharge Area A and 17 gpm in Area B (Section 727; Drawings 7-3 and 7-4; Appendix 7-3), so in a worst-case scenario, the Applicant would be required to replace approximately 52 gpm of state appropriated water rights. The Applicant states that the proposed water well in Section 29, T. 39 S., R. 5 W. will be designed to produce water sufficient to meet that demand, and further that the aquifer analysis in Appendix 7-1 suggests that the yield of the alluvial ground-water system should be capable of sustaining discharges of the duration and

volume likely needed to replace the water. The Applicant notes that the likely duration will be relatively short (Section 728).

The Applicant has entered into a written agreement with the town of Alton, Utah to transfer the point of diversion for 50 acre-feet of water for use at the Coal Hollow Mine. A copy of this agreement is included in Appendix 7-8

Under Direct Interception of Groundwater Resources (p. 7-25), the Applicant states:

*“Alluvial groundwater systems in planned mining areas in the proposed Coal Hollow Mine permit area will be directly intercepted by the mine openings. It is not anticipated that the direct interception of shallow alluvial groundwater will adversely impact the overall hydrologic balance in the region. This is because no springs, seeps or other important groundwater resources have been identified in proposed mine pit areas (Drawing 7-1). In the pre-mining condition, any diffuse groundwater discharge to the ground surface that occurs is primarily lost to evapotranspiration and does not contribute appreciably to the overall hydrologic balance in the area.”*

This addresses ground water that supplies springs and seeps but seems to ignore the importance of subirrigation to what is possibly an adjacent AVF and dismisses the impact that direct interception of ground water in the alluvial aquifer would have on the moisture held in the soils and the essential hydrologic function of the adjacent, potential AVF.

Reference is made to Drawing 7-1, which shows the seep and spring locations; however, the Application needs a single map that shows the extent of the pits – including the extent of overburden removal (Drawing 5-16), the location of the fault and Tropic Shale Ridge (Drawing 7-12), the location of the seeps and springs (Drawing 7-1), and the Alluvial Discharge Areas (Drawing 7-4). Such a map doesn't need to show the entire permit area, but rather should center on Pit 15, where the features of interest are proximate and the possibility of impacting the hydrologic balance and the essential hydrologic function of what is possibly an AVF is greatest (see deficiency written under R645-301-624, -724).

Water replacement is discussed in Section 727. Long-term diminution of flow will be replaced with water from a well that has not been drilled yet. The town of Alton has entered into an agreement to transfer a point of diversion for water rights to 50 acre-feet of water, which the Applicant plans to use to satisfy the water replacement requirements: a copy of the agreement is in Appendix 7-8. The planned new water well will be constructed on lands currently leased by Alton Coal Development, LLC. It is not clear if this new well will be the water-supply for the mine, or for water-replacement only (see deficiency written under R645-301-731.530, p. 126 of the TA).

The Applicant concludes that there is essentially no probability that surface water in the Sink Valley Wash drainage could become unavailable as a result of the proposed mining and reclamation activities: the surface waters originate from up-gradient areas that are located large distances from the proposed mining, and the stream channels are entirely outside the area to be disturbed by mining and reclamation activities. The application states that in the Sink Valley Wash drainage, surface-water flows in Water Canyon and Swapp Hollow are used for stock watering and limited irrigation: Drawing 7-3 shows there are water rights for surface point-of-diversion and point-to-point diversions along Sink Valley Wash but none in the two mentioned tributary drainages. (Monitoring at point SW-8 in Swapp Hollow has consistently noted flow in this channel.) The application also states that below Section 29 T. 39 S., R. 5 W., Sink Valley Wash usually has no appreciable discharge: there are point-to-point and surface point-of-diversion water rights in Sink Valley Wash below Section 29 (Drawing 7-3).

The application indicates Lower Robinson Creek immediately above the proposed permit area typically discharges only in direct response to precipitation or snowmelt, so surface-water availability is limited. Ground water seeps from the alluvium into the deeply incised stream channel near the exposed Dakota-alluvium contact in the bottom of the stream channel, in the SE¼, Section 19, T. 39 S., R. 5 W. (the Applicant considers it noteworthy that the location of this discharge has varied somewhat over time, but offers no further comment on the possible significance of this observation). This seepage, monitored at SW-5 (Drawing 7-2), is characterized as usually 5 - 10 gpm or less: significantly larger flows, as great as 410 gpm, have been reported at this site (Division's database), although such large flows are presumed to be runoff – the database does not distinguish seepage from runoff.

### Surface-Water Monitoring Plan

The protocol for baseline and operational surface-water monitoring is in Tables 7-4 through 7-6B. Drawing 7-2 shows baseline monitoring locations except for BLM-1 (BLM-1 is shown on Drawing 7-10). Section 724.200 discusses baseline surface-water monitoring; three paragraphs at the end of Section 724.200 describe baseline surface-water monitoring sites. As shown on Drawing 7-3, SW-18 is on an ephemeral wash located over a mile outside the permit area, and the Applicant has not observed any discharge at SW-18 during monitoring: SW-18 is not included in Table 7-5 because it is not proposed for operational monitoring, and SW-18 is not in the Division's database. Discrepancies between Section 724.200, Drawing 7-2, and Table 7-5, shown in the following table, need to be resolved (see deficiency written under R645-301-724.200 and -121.200).

Baseline Monitoring Sites	Described in Section 724.200	Listed in Table 7-5	Shown on Drawing 7-2	Data in Database
SW-1	√		√	√
SW-2	√	√	√	√

**ENVIRONMENTAL RESOURCE INFORMATION**

Page 71  
C/025/0005  
March 26, 2009

SW-3	✓	✓	✓	✓
SW-4	✓	✓	✓	✓
SW-5	✓	✓	✓	✓
SW-6	✓	✓	✓	✓
SW-7	✓		✓	✓
SW-8	✓	✓	✓	✓
SW-9	✓	✓	✓	✓
SW-10			✓	✓
SW-18			✓	
SW-101	✓	✓	✓	✓
BLM-1		✓	(Drawing 7-10)	✓
RID-1	✓	✓	✓	✓
Lamb Canal			✓	✓

The Applicant will apply for a UPDES permit to discharge from the mine pit, to either Lower Robinson Creek or Sink Valley Wash, which are both tributary to Kanab Creek.

**Findings:**

Hydrologic Resource Information is not sufficient to meet the requirements of the Coal Mining Rules. Before the Division can approve this mine plan, the Applicant must provide the following, in accordance with:

**R645-301-624, -724**, Restated deficiency from Task 2910. The Applicant needs to show the extent and depth of the proposed pits on the geologic cross sections of Drawings 6-3, 6-7, and 6-8. Also, to more clearly convey the importance of the Sink Valley Fault and associated Tropic Shale ridge in the relationship of the hydrologic systems to the proposed mine, the Applicant needs to show the Sink Valley Fault on several other maps and cross sections, including but not limited to: Drawings 7-1, 7-4, 7-7, 7-12, 5-10, 5-17, 5-18, and 5-19. As an alternative, the Applicant could create new maps and cross sections that clearly show the extent of the pits – including the extent of overburden removal (Drawing 5-16); the location of the fault and Tropic Shale Ridge (Drawing 7-12); the location of seeps and springs (Drawing 7-1); the potentiometric surface (Figure 13 and Drawing 7-13); the Alluvial Discharge Areas (Drawing 7-4); and – if known - location, extent, thickness or top-elevation of the saturated zone(s) of the alluvial aquifer. Such maps and cross section don't need to cover the entire permit area; larger scale maps and cross sections, centered on Pit 15 where the possibility of impacting the hydrologic balance and the essential hydrologic function of the possible AVF is greatest, would be preferable. Cross sections should be approximately 1000 feet apart and must extend beyond the Permit Boundary far

enough to show the relationship of the proposed mining to hydrology of the adjacent area; all cross sections should extend east far enough to include the Sink Valley Wash channel. [JS]

**R645-301-720**, Restated from Task 2910. All water rights that have a potential to be impacted by mining will be monitored. Water rights need to be submitted in a table that identifies all of the following information: the water right, the sampling site number, the type of water right (domestic, irrigation, stockwatering), the amount of the water right, recorded flow, ownership and status. [DWD]

**R645-301-720 and R645-301-121.200**, In the following statement on page 18 of Appendix 7-7, the Applicant needs to clearly identify the Section and quarter-section where the trenches in T. 39 S., R. 5 W. were dug, "...Shallow alluvial groundwaters were sampled from trenches in the alluvial system in the eastern 1/4 of Section [?] T39S, R5W in April 2006," [JS]

**R645-301-722.300**, Restated deficiency from Task 2910. The Applicant needs to clarify the difference between the wells shown on Drawing 7-2 and those on Drawing 7-12. It still isn't clear why the wells on Drawing 7-12 and on Figure 12 of Appendix 7-1 are not included in the baseline monitoring points shown on Drawing 7-2. Drawing 7-2 shows spring, stream, and well baseline monitoring location; however, Drawing 7-12 shows additional wells used to gather baseline data, and most of them were installed by the Applicant for this permit application. The excerpts from the Application below need clarification:

*"722.300 Baseline monitoring stations Baseline monitoring stations are shown on Drawing 7-2. A map showing the locations of monitoring wells in the proposed Coal Hollow permit and adjacent area is presented in Drawing 7-12 and on Figure 12 of Appendix 7-1. Drawings 7-2 and 7-12 also show monitoring stations from which baseline hydrologic data were collected in previous studies. Monitoring station locations, elevations, and other details are presented in Table 7-1."*

*"724.100 Groundwater Information "The location of wells and springs in the proposed Coal Hollow Mine permit and adjacent area are shown on Drawings 7-1 (Spring and seep survey map), 7-2 (Baseline monitoring locations), and 7-12 (Monitoring well location map)..."[JS]*

**R645-301-724.100**, Restated deficiency from Task 2910. The applicant needs to consolidate well information so it is more readily accessed. The applicant should develop a **single table** to show **all** wells which are in the database, show which wells are monitored, which ones have water rights, ownership, collar elevation,

ground elevation, depth to water from ground, elevation of water, which map they are located on and how they are monitored (for field and quality parameters, field parameters, elevation only). The applicant stated; a new well information summary table (Table 10) was submitted with the new permit application. Table 10 could not be found. • The applicant needs to consolidate spring information so it is more readily accessed. The applicant should develop a table to show **all springs**, which ones are monitored, which ones have water rights, ownership, flow range, which map they are located on and how they are monitored (for field and quality parameters, field parameters, flow only). The applicant mentioned the spring information summary table (Table 11) was submitted with the new permit application. Table 11 could not be found. • The applicant will need to show the seasonal variation of ground water on a map for the entire permit area and adjacent area. During the last review the Applicant was asked to show the seasonal variation of ground water on a map for the entire permit area and adjacent area. The applicant provided Figures 13 showing the average depths to groundwater relative to surface in the alluvial groundwater system in the proposed and adjacent permit area during 2007. Wells Y-102, Y-61 and Y-59 and C-5 showed artesian flow. Figure 14 is presented to show the seasonal variation in groundwater levels in the alluvial system during 2007. It is assumed that the values in Figure 14 represent the total change, but it is not the information the Division was requesting. The applicant needs to provide the seasonal variation as isohyatal lines for quarterly changes, as monitored represented by isopiestic lines. [DWD]

**R645-301-724.200 and-121.200**, Deficiency restated from Task 2910,

- The surface-water baseline discrepancies between Section 724.200, Drawing 7-2, Table 7-5, and the Division's database, as outlined in the following table, still need to be resolved. BLM-1 is on Drawing 7-10, but the Applicant needs to include it on Drawing 7-2, which shows baseline monitoring points.

Baseline Monitoring Sites	Described in Section 724.200	Listed in Table 7-5	Shown on Drawing 7-2	Data in Database
SW-1	√		√	√
SW-7	√		√	√
SW-10			√	√
BLM-1		√	(Drawing 7-10)	√
Lamb Canal			√	√

The Applicant stated in the cover letter for the December 2008 submittal that "Surface-water baseline monitoring sites SW-10, BLM-1, and Lamb Canal were

added to the description in Section 724.200", but no such information has been added to that section of the application. The Applicant must clarify this. [JS]

**R645-301-724.500**, Deficiency restated from Task 2910. The Applicant needs to provide a map – or set of maps – illustrating the size and shape of the cone of depression from the pump-drawdown test at Y-61. •Figure 18 in Appendix 7-1 indicates that during the pump test, water levels actually increased at SP-8 and SS-30, and flow increased at C2-40 after 4 hours of pumping; the Application should include a discussion of these increases. [JS]

**R645-301-727**, Restated from deficiency Task 2910. Sections 728.310, (*Draining of up-gradient groundwater resources*, p. 7-29) and 728.334 (p. 7-44) still refer to Y-61 as a water production well: the Applicant needs to clarify the proposed purpose of Y-61. [JS]

**R645-301-728**, The stream laid deposits in Sink Valley will not be mined, however some of the ground water in the Sink Valley alluvium comes from the adjacent colluvial sediments. Groundwater flow to and through alluvial sediments in the potential AVF should be determined. [DWD]

**R645-301-728 and -121.200**, Sections 724.500 and 728.310, p. 7-31 state that backfilling and individual mine pits will remain open for no more than 60 to 120 days, but it is not clear whether this timeframe is 60 – 120 days post mining or whether the timeframe includes both mining and reclamation. The Application should be more specific in Sections 724.500 and 728.310 concerning the length of time that a pit may remain open during coal recovery through completion of backfilling.[PB, JS]

**R645-301-728.310**, Restated deficiency from Task 2910. The Applicant shall supply a series of cross-sections that depict the relationship between the mine pit and Sink Valley trough, and show the expected change in the groundwater head as a result of mining. The detailed cross sections should illustrate the depth and distance (length) of open pit face that potentially intercepts the groundwater regime in Sink Valley. Cross sections should be projected through the permit area and Sink Valley every 1,000 feet, or through the mine pits. All cross sections should show the expected levels where mining will intercept Sink Valley and be depicted accurately on a horizontal and vertical scale. Cross-sections should depict the change in groundwater from east to west. Cross-sections should also be generated from data to show the change in groundwater from north to south. (The Division recognizes that the changes in groundwater interception will be dynamic as pits are opened and closed.) The Applicant submitted one cross-section in Drawing 7-6 showing the mine workings in Pit 15. The drawing shows the interception of

the alluvial basin in Sink Valley, but does not show the draw down of groundwater during mining and the recovery after mining. An aerial view projecting groundwater draw down and recovery should also be presented. •The Applicant should discuss how the pit will be reclaimed to restore the pre-existing groundwater level in Sink Valley. [DWD]

**R645-301-728.334**, Restated deficiency from Task 2910. Under Direct Interception of Groundwater Resources, the Applicant states that:

“Alluvial groundwater systems in planned mining areas in the proposed Coal Hollow Mine permit area will be directly intercepted by the mine openings. It is not anticipated that the direct interception of shallow alluvial groundwater will adversely impact the overall hydrologic balance in the region. This is because no springs, seeps or other important groundwater resources have been identified in proposed mine pit areas (Drawing 7-1 [and Dwg. 5-2]). In the pre-mining condition, any diffuse groundwater discharge to the ground surface that occurs is primarily lost to evapotranspiration and does not contribute appreciably to the overall hydrologic balance in the area.”

This addresses ground water that supplies springs and seeps but seems to ignore the importance of subirrigation to what is possibly an adjacent AVF and dismisses the impact that direct interception of ground water in the alluvial aquifer would have on the moisture held in the soils and subsurface flow and other components of the essential hydrologic function of the potential AVF. The Applicant needs to address the possible impacts of interception of the alluvial aquifer on subirrigation and soil moisture in the adjacent, potential AVF. [JS]

**R645-301-731.100 and R645-301-731.200**, The Applicant shall provide seasonal baseline water monitoring information for all water rights that could be affected by mining in the permit and adjacent area. [DWD]

**R645-301-731.800**, The Applicant must provide information on water replacement for the domestic water supply for the Sorensen Ranch, including a basic description of the current system, how the water supply will be monitored, and how the water supply will be replaced if interrupted, diminished, or contaminated.[JS]

**R645-301-742.313 and R645-301-553.110**, As currently proposed, the plan calls for the temporary diversion of a reach of the Lower Robinson Creek stream channel in the southeast 1/4 of Section 19, T. 39 S., R. 5 W. Details of the proposed diversion are given in Chapter 5, Section 527.220 of the MRP. Statements on pp. 7-19, 7-28, 7-46, and 7-57 in the MRP refer to this as a permanent diversion; the Applicant needs to remove these statements or correct them to indicate that this will be a temporary diversion.[JS]



## MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

### Analysis:

#### Affected Area Boundary Maps

In response to Task 2910 deficiency: R645-301-521, the Applicant re-created the following maps to utilize the following R645 Coal Mining Rules terminology, "permit boundary" and "permit area":

- Drawings 1-1 through 1-4
- Drawing 2-2
- Drawing 3-1 through 3-6
- Drawing 5-1, 5-2, 5-3, 5-9, 5-10, 5-13, 5-14, 5-15, 5-16, 5-16, 5-17, 5-18, 5-19, 5-20, 5-21, 5-22, 5-23, 5-25, 5-26, 5-27, 5-33, 5-34, 5-35, 5-36, 5-37, 5-38, 5-39
- Drawings 6-1, 6-2, 6-5, 6-9
- Plates 3 and 4 of the AVF Report
- Drawings 7-1, 7-2, 7-3, 7-10, 7-12.

The Applicant has also identified land leased from C. Burton Pugh, which lies outside of the Coal Hollow permit boundary. The leased acreage is identified on Drawing 1-3; the Applicant's interest is declared on Page 1-6, Chapter 1, Volume 1. Some private ownership remains on the southeast side of the proposed permit area (See Dwg. 1-4, Coal Ownership).

The Applicant states that there are no other areas outside of the proposed permit boundary which are under the exclusive control Alton Coal Development.

Kane County Road #136 will remain under the jurisdiction of Kane County and same will be maintained by the County as a public road (See Appendix 1-7). The Kane County Road K3900 (136) Closure, Relocation and Replacement Agreement, Miscellaneous Provision C are contained on Page 7.

Previous task 2910 deficiency: R645-301-521.130 through R645-301-521.132 and R645-301-521.141, *"The Applicant must address plans to build a public road that will bypass the town of Alton to facilitate mining. The Division has received comments from Alton residents that the town officials have been in negotiations with the Applicant to build a bypass road. The purpose of the bypass road is to route coal truck traffic around Alton. Road construction solely for the purpose of facilitating coal mining is considered "affected area" as defined by R645-100-200 and must be shown on mine maps."*

Alton Coal Development, LLC. has responded that they have no plans for a by-pass, mine haul road. Drawing 1-1 Project Area shows that the north permit boundary for the Coal Hollow Mine is at least two miles from the Town of Alton. The construction of a publicly used, by-pass road around Alton would be under the jurisdiction of the Kane County Commissioners and the Kane County Road Department.

### **Existing Structures and Facilities Maps**

Drawings 1-5 and 1-6 show the location of all buildings in and within 1000 feet of the proposed permit area.

Drawing 1-5 shows the Swapp Ranch (now occupied by the Dames family), which is a frame construction on a layered rock foundation. This dwelling is just over 300 feet from the east permit boundary. Drawing 1-5 is P.E. certified by Mr. Chris McCourt, a Utah registered professional engineer.

Drawing 1-6 shows the various buildings associated with the Sorensen Ranch. Drawing 1-6 is also P.E. certified by Mr. McCourt. The ranch house, which is a wood frame construction on a layered rock foundation, is 950 feet from the closest permit boundary. All other buildings are wood frame construction with no concrete foundations.

Since these two dwellings are within 1,000 feet of the permit boundary, the permit Applicant must submit an anticipated blast design for overburden and coal removal. Chapter 5, p. 5-22 states that Appendix 5-4 contains a blasting plan (anticipated) for the Coal Hollow Mine. Appendix 5-4 is reviewed under Operation Plan/Use of Explosives section of this Technical Analysis.

### **Existing Surface Configuration Maps**

The Applicant has provided maps which show 5 foot contour intervals, including Drawings 5-1, 5-20, 5-20A, 5-21, 5-21A, 5-22, 5-35, 5-36, 5-37, 5-37A.

### **Mine Workings Maps**

There are no other currently active coal mining operations in this area. Page 5-8, Chapter 5, Section 521.110, Previously Mined Areas states that the following underground mining operations previously existed within the Alton Amphitheatre; Seaman Mine, Smirl Mine, Alton Mine, Johnson Mine, and Silver Mine. The PAP states that these mining operations did not exist within the currently proposed permit area or the adjacent area as defined in R645-100-200. The Permittee has not provided any maps of underground workings for these operations.

### **Permit Area Boundary Maps**

Previous task 2910 deficiency: R645-301-521.132, *"The Applicant must update all permit area boundaries to show that the access road from the closed section of County Road 136 to the mine site will be within the permit area."*

The Permittee responded to the above deficiency in this manner: *"The section of road from the permit boundary, north to the road relocation point will remain under the jurisdiction of Kane County and will be maintained by the County as a public road. For details related to this road status, refer to Appendix 1-7; the Kane County Road K3900 (136) Closure, Relocation and Replacement Agreement, Miscellaneous Provision C, Page 7. Since this section of road will continue to be a public road under the jurisdiction of Kane County it is not included as part of the permit area in this application. All drawings showing the closure point of this road and access to the facilities area are modified to be consistent with this agreement."*

The Division is responsible for approving or disapproving coal mining permits in the State of Utah (R645-300-112.100). Drawing 1-4 Coal Ownership indicates that Kane County road #136 traverses private coal and Federal / BLM coal. The Division is responsible for the backfilling, grading and compaction of spoil within the County road #136 right-of-way as well as areas on either side of the 66 foot wide County Road R. O. W.

### **Surface and Subsurface Manmade Features Maps**

Only two man-made surface and sub-surface features have been identified within the proposed Alton permit area (Page 5-8, Chapter 5, Section 521.122).

The Kane County road #136 (feature #1) is identified on Drawing 5-3.

Page 5-9, Chapter 5, Section 521.124 of the Task ID # 3100 application states that there is one impoundment located within the permit area (Pond 20-1). Pond 20-1 is shown on Drawing 7-7. The surface area of this impoundment is 3,400 square feet.

There are no other areas of existing spoil, waste, coal development waste, and noncoal waste disposal, dams, embankments, other impoundments and water treatment, and air pollution control facilities within the permit area.

Drawing 7-7 is P.E. certified by a Utah registered professional engineer.

### **Surface and Subsurface Ownership Maps**

The Applicant met the requirements of this section. The Applicant provided Drawing 1-3 Surface Ownership and Drawing 1-4 Coal Ownership, which show surface and coal ownership.

### **Subsurface Water Resource Maps**

Ground-water resources consist of both springs and wells. Artesian conditions have been documented in several wells, and some have sufficient head to flow. 7-13 shows the potentiometric or water-table elevations of the alluvial ground-water system. This is somewhat deceptive because it does not relate ground water to the surface topography, i.e., it gives the impression of a fairly uniform subsurface water table, whereas the data show springs and seeps, flowing wells, and areas of confined and unconfined conditions, and two areas where ground water flows to the surface. Figure 13 of Appendix 7-7 has been added to show the potentiometric elevations in relation to the surface elevation.

Drawing 7-13 has contours but no potentiometric data values, while Figure 13 has potentiometric data values but no contours. Data and contours should be shown on each map. The Applicant needs to add contour lines to Figure 13 of Appendix 7-7, potentiometric data to Drawing 7-13.

Section 722.100 states, "...It is important to note that the alluvial ground-water potentiometric contours depicted in Drawing 7-2 are not representative of a laterally or vertically continuous ground-water system..." and "...Consequently, it is not appropriate to evaluate regional potentiometric trends over large distances or to infer precise ground-water flow directions or hydraulic gradients in the alluvial ground-water system based on Drawing 7-2. The alluvial ground-water system potentiometric map presented in Drawing 7-2 is useful for evaluating approximate local potentiometric conditions general saturation trends...." (Emphasis Added). Drawing 7-2 does not contain potentiometric data, so the erroneous references to Drawing 7-2 needs to be corrected. Cross sections on Figures 6b through 6g in Appendix 7-7 show water-level variations in the Alluvial Groundwater Systems between June and November -December 2007 at selected wells. Drawing 14 of Appendix 7-7 shows the seasonal variation of head during 2007, but the values have not been contoured. Also, although the numbers imply the water levels rose between June and December, this isn't clear.

The water right designations for springs on Drawings 7-1, 7-2, and 7-10 do not match the locations on Drawing 7-3; e.g., SP-3, SP-4, SP-5, and SP-6 on Drawing 7-3 are respectively (and approximately) SP-40, SP-19, SP-20, and SP-23 (or -24) on the other drawings. The Applicant must use a consistent ID system.

### **Surface Water Resource Maps**

The locations of streams, stock watering ponds, and conveyance ditches in the proposed Coal Hollow Mine permit and adjacent area are shown on Drawing 7-7.

### **Archeological Site Maps**

These are included in the Data Recovery plan in the confidential section of the application.

### **Cultural Resource Maps**

These are included in the Data Recovery plan in the confidential section of the application.

### **Monitoring and Sampling Location Maps**

Drawing 3-1 includes the vegetation monitoring and reference area locations permit area boundary and coal ownership boundaries.

### **Permit Area Boundary Maps**

Drawing 3-1 includes the vegetation monitoring and reference area locations permit area boundary and coal ownership boundaries.

### **Vegetation Reference Area Maps**

Drawing 3-1 includes the vegetation monitoring and reference area locations permit area boundary and coal ownership boundaries.

### **Affected Area Boundary Maps**

Affected area boundary maps for vegetation and fish and wildlife information are located in Volume 3, Chapter 5, Plates 5-1, 2, 9, 10, 13, 14, and 5.

### **Findings:**

Maps, Plans and Cross Sections of Resource Information are not sufficient to meet the requirements of the Coal Mining Rules. Before the Division can approve this mine plan, the Applicant must provide the following, in accordance with:

**R645-301-722 and 512.110, -512.140, -512.150,** The Application needs a single map that shows the extent of the pits – including the extent of overburden removal (Drawing 5-16), the location of the fault and Tropic Shale Ridge (Drawing 7-12), the location of the seeps and springs (Drawing 7-1), and the Alluvial Discharge

Areas (Drawing 7-4). This drawing doesn't need to show the entire permit area, but rather should center on Pit 15, where these features are proximate to each other and the possibility of impacting the hydrologic balance and the essential hydrologic function of the potential AVF is greatest. [JDS]

**R645-301-720 and -121.200**, Spring locations on Drawings 7-1, 7-2, and 7-10 do not match those on Drawing 7-3. The Applicant must resolve this confusion. [JS]

**R645-301-121.200, -722.100**, Section 722.100 contains the statements that, "...It is important to note that the alluvial ground-water potentiometric contours depicted in Drawing 7-2 are not representative of a laterally or vertically continuous ground-water system..." Drawing 7-2 does not contain potentiometric data; Drawing 7-13 and Figure 13 of Appendix 7-7 contain this information; however, Drawing 7-13 has contours but no potentiometric data values, while Figure 13 has potentiometric data values but no contours. Both data and contours need to be shown on the same map.

- The Applicant needs to add contour lines to Figure 13 of Appendix 7-7 and
- Potentiometric data to Drawing 7-13.
- The erroneous references to Drawing 7-2 need to be corrected. [JDS]

**R645-301-722.100**, Restated from Task 2910, Drawing 14 of Appendix 7-7 shows the seasonal variation of head during 2007, but the values have not been contoured.

- The Applicant needs to add contour lines to Figure 14 of Appendix 7-7. Also, although the numbers imply the water levels rose between June and December, the Applicant needs to clarify this. [JDS]

## OPERATION PLAN

### MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

#### Analysis:

The Division received a comment that the Operation Plan is not specific to local hydrologic conditions nor does it address potentially adverse hydrologic consequences because the PHC is not complete. As discussed in this and other Tech Reviews, there are deficiencies in the baseline data and in the PHC that need to be addressed, but these deficiencies are not fatal flaws that have precluded the Applicant from formulating an Operation Plan. The Operation Plan submitted by the Applicant is based on valid baseline data and a reasonable draft PHC determination. All three elements are subject to revision as the deficiencies are addressed by the Applicant.

The Applicant did not meet the general requirements of this section. Those general requirements include:

- In Section 523 the Applicant described the type of coal mining procedures, anticipated annual and total production of coal, by tonnage, and some major equipment they will use for all aspects of those operations.
- In Section 536, Section 528 and Section 553 the Applicant described the construction, operation and reclamation of the mine facilities. The Division will analyze specific facilities in other sections of the Technical Analysis (TA).

The Applicant has described a 2MT, 24 hr/day 6 day/week operation in Introduction to the PAP. In consultations with the Governor's Office in 2005 and with the DEQ and DOGM in 2007, the Applicant described a 2 MT, 2 shift/day, 6 day/week operation. As explained to the Governor's Office in 2005, the initial decision for a 2 shift work day was made to avoid night sky issues that were raised in the Cecil Andrus 1980 Suitability decision (Ex. 3, App. 1-3). The night sky issue has been raised by commenters during the recent public comment period and by the USFS and Bryce Canyon National Park in comments provided to the Division. The application must explain the equipment required for lighting the 24 hour operation and the effect on the night sky as seen from Bryce Canyon National Park and the Dixie National Forest.

- Section 526.220 has been revised to include a list of anticipated lighting equipment that would likely be used to illuminate the night mining operations. The Division will

---

OPERATION PLAN

---

analyze the list of specific equipment under the Support Facilities and Utility Installations section of this TA.

- However the Applicant has not discussed the effect on the night sky as seen from Bryce Canyon N. P. and the Dixie N. F. Therefore, this deficiency remains and must be addressed prior to receiving a recommendation for approval.

This issue was specifically raised in comments sent to the Division of Oil Gas and Mining by the public and from the District Ranger of the Dixie National Forest (2008/Incoming/0048.doc).

Such issues were also the subject of discussion in the federal unsuitability decision made for surface mining of federal lands within T 39 S, R. 5 W. by Cecil Andrus, Secretary of Interior's on December 16, 1980 (App. 1-3, Ex. 1). Secretary Andrus specified in items 5 and 6 of the unsuitability determination that any future specific mining plan or permit application for surface mining of the other federal lands in the Alton Coal field should be reviewed for visibility, vibration, and noise issues by the Department of Interior (through the National Park Service and the Office of Surface Mining) to determine whether specific conditions or stipulations should be placed on the permit. The Secretary stressed that the unsuitability designation was not "the only basis for protection of the values for which Bryce Canyon National Park was established," and directed the Department of Interior to take Park values into account in future decisions on undesignated federal lands near the park. For surrounding federal lease areas, these issues are being reviewed by the BLM in the Draft Alton Coal Tract LBA Environmental Impact Statement (EIS).

### **Findings:**

The information provided in the application is not considered adequate to meet the requirements of this section. Before approval, the Applicant must provide the following in accordance with:

**R645-301-526.220**, Restated from Task 2910. The application must describe the effect of lighting the 24 hour operation on the night sky as seen from Bryce Canyon National Park and the Dixie National Forest. This issue was specifically raised in comments sent to the Division of Oil Gas and Mining by the public and from the District Ranger of the Dixie National Forest (2008/Incoming/0048.doc). [PHH, PB]

### **EXISTING STRUCTURES:**

Regulatory Reference: 30 CFR 784.12; R645-301-526.

### **Analysis:**



In Section 526.100 of the PAP, the Applicant states that there are no existing structures within the permit area.

**Findings:**

The information provided in the application is considered adequate to meet the requirements of this section.

## **PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES**

Regulatory Reference: 30 CFR 784.17; R645-301-411.

**Analysis:**

Lands to be disturbed by coal mining and reclamation are not "unsuitable" as defined by 40-10-24(4) of the Act. Coal mining and reclamation operations would not adversely affect any publicly owned park or any place included in the National Register of Historic Places (R645-103-326). SHPO provided concurrence (7/14/08) on the Cultural Resource Management Plan (CRMP) and Data Recovery plan for seven archaeological sites that will be adversely affected. The CRMP and Data Recovery plans are found in Confidential App. 4-1.

**Findings:**

The information provided in the application meets the requirements of this section.

## **RELOCATION OR USE OF PUBLIC ROADS**

Regulatory Reference: 30 CFR 784.18; R645-301-521, -301-526.

**Analysis:**

The Applicant did not meet the requirement of this section.

Task 2910 deficiency: **R645-301-526.116**, *"The application must state whether Alton Coal Resources, LLC. Or Kane County will take charge of the County Road #136 re-alignment and subsequent reclamation. Details of the public road 136 re-alignment must be included as an appendix to the application and include the use of cattle guards and fencing in the design(requested during informal conference comment period)and describe measures for*

*protection of the public during construction. The reclamation plan narratives and maps must be revised to describe construction of the road in its approximate original alignment."*

Section 526.116 has been revised to clarify that Kane County will take charge of the County Road 136 (K3900) re-alignment onto adjacent federal land during mining and restoration of K3900 to its approximate original alignment upon final reclamation of the proposed mine. Appendix 1-7 provides the details of that agreement.

One public comment received during the June 2008 Informal Conference concerning the livestock protection (fencing, cattle guards) along the road has been incorporated into the details of the County Road Agreement. That portion of K3900 extending from the relocation point to the mine permit boundary will be maintained by the County and continue to provide access for landowners, as required by R645-301-521.133.

Kane County will be solely responsible for the construction of the temporarily, re-aligned segment of County road #136 (K3900) during the coal recovery operation.

Alton Coal Development, LLC. is responsible for coal recovery, backfilling, compaction and reclamation activities in the right-of-way and adjacent areas of Kane K3900, to create a stable fill for final re-construction of K3900 in its approximate original alignment. These backfilling and compaction activities fall under the jurisdiction of the Division. At this time, the Division is not certain if backfilling and compacting of the weathered tropic shale can meet sub-grade specifications such that K3900 can be re-constructed in its approximate original location. Consequently, the Division has asked that additional information be provided under Reclamation Plan/Road Systems section of this TA.

As required by R645-103-234 for relocation and closure of a public roads, the Division has placed a notice in the Southern Utah News to run on March 25, 2009 notifying the public of the proposed temporary road relocation for K3900. Appendix 1-7 indicates that the County will also provide for a public hearing on the K3900 road relocation.

County Road K3993 (which parallels Lower Robinson Creek on private land held by Pugh) will be closed for the life of mine. This road closure was included in the March 25, 2009 public notice as well.

### **Findings:**

The information provided in the application is considered adequate to meet the requirements of this section. To ensure a stable fill for the re-construction of K3900 in its approximate original alignment, the Division has asked that additional information be provided under Reclamation Plan/Road Systems section of this TA.

## AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244, -301-420.

### Analysis:

The Applicant is required to obtain an Air Quality Approval Order prior to receiving a permit to mine. The first step in acquiring an Air Quality Approval Order is to file a Notice of Intent with the Utah Division of Air Quality (DAQ).

One comment received indicated that the Applicant had not filed a Notice of Intent with the Utah Division of Air Quality (DAQ). However, the Permit Application Package indicates that Alton Coal Development, LLC provided the DAQ with a Notice of Intent (NOI) on May 8, 2007 (Section 422 and Appendix 4-2). On July 2, 2008, Maung Maung of the DAQ confirmed that the NOI had been received in May 10, 2007, and review is pending.

Several comments were received during the public comment period and during the informal conference that the ambient and fugitive dust might degrade the characteristic clear skies of the area; that the fugitive dust might affect water quality of nearby streams and perhaps the groundwater; and that uncovered haul trucks might leave coal fines in their wake.

Task 2910 deficiency: **R645-301-423 et seq.**, *"The Applicant refers to pages 8 – 10 of the NOI, Limitations and Test Procedures, (Appendix 4-2) for compliance with R645-301-423, the air pollution control plan, and R645-301-423.100, the air quality monitoring program to evaluate the effectiveness of the fugitive dust control practices proposed and R645-301-423.200, the plan for fugitive dust control practices. This is unacceptable, because, the NOI does not require regular monitoring of visible emissions by the Applicant. The NOI and the Air Quality Approval Order are tools used by the DAQ to promote compliance with the Clean Air Act. The terms of the NOI are monitored by the DAQ and enforced by the DAQ. Since the monitoring and evaluation requirements of R645-301-423 et seq, for surface mines producing greater than 1,000,000 tons/year will be enforced by the Division, the monitoring and evaluation plan must be clearly stated in the permit application, with the results provided in the Annual Report, and available to the Division inspectors. The monitoring and evaluation plan should include provisions for monitoring and controlling fugitive dust and coal fine deposition by the Applicant to control pollution attendant to erosion (R645-301-244.100) and to protect water quality (R645-301-526.221 and 526.222) from the open stockpiles of overburden, from coal stockpiles, from crushers, screens, conveyor transfer and drop points. The plan should indicate that the monitoring information and accompanying summary evaluation of emissions will be provided in the Annual Report, and be available to the Division inspectors upon request."*

The application states in Section 521.168 (pg. 5-15) that there are "no specific air pollution collection or control facilities proposed." Public concerns are partially addressed by the Applicant's fugitive dust control plan found in Appendix 4-5, required by R645-301-423. The plan is required to stabilize exposed surface areas (R645-301-244.100); to prevent, minimize and control erosion of regraded areas (R645-301-244.300); and to control sediment contributions to streams (R645-301-244.320 and R645-301-526.220, *et seq*). The App. 4-5 fugitive dust control plan includes the following:

- Mulch or tackifier application for unseeded topsoil/subsoil stockpiles.
- Seeding of topsoil stockpiles in existence longer than one year.
- Tackifier on graded, unseeded reclamation areas.
- Water sprays (as needed) for material handling points (crushing, screening, transfer, loading, dumping); for excavation and pushing activities; for construction and demolition; for drilling and blasting; and for cleared areas.
- Water sprays or chemical treatment or gravel as needed on unpaved roads and yard areas.
- Synthetic cover on haul truck beds as needed.
- Coarse gravel at entrances to and exits from public roads.

The App. 4-5 monitoring program includes the following:

- The site supervisor will periodically observe the dust at the permit boundary to determine the level of control needed.
- 0 – 5% opacity at the permit boundary triggers increased watering frequency and an application of magnesium chloride on the Out of Pit haulroads.
- 5 – 10% opacity will result in even more water and/or magnesium chloride applications
- Greater than 10% at the permit boundary triggers increased watering frequency and an application of magnesium chloride on the Out of Pit haulroads.
- Production will stop if dust can not be reduced to 5 – 10% opacity.
- Records of watering will be provided in the Annual report.

The App. 4-5 fugitive dust control plan fails to acknowledge that monitoring and evaluation are requirements of R645-301-423 *et seq*, for surface mines producing greater than 1,000,000 tons/year and will be enforced by the Division, not the UDEQ. The plan for fugitive dust control practices addresses the requirements of R645-301-244.100 to protect (mulch) and stabilize (tackifier) exposed surface areas (topsoil and subsoil piles and regraded areas). The monitoring program does not address the grading requirements of R645-301-244.300 for areas other than topsoil stockpiles. The monitoring program does not include measurements of the effectiveness of mulching and tackifier applications to control fugitive dust and erosion from exposed surface areas.

The monitoring program should specify what techniques will be used to determine opacity from a non-point source such as the permit boundary.

## Findings:

The information provided in the application does not meet the requirements of the Air Quality rules. Prior to approval, please provide the following, in accordance with:

**R645-301-422**, The Notice of Intent (App. 4-2) prepared by ACD to obtain an Air Quality permit states in Item 14 that the mine open mining area shall not exceed limits established by the DOGM. This is not acceptable, because DOGM does not evaluate the size of the open pit in relation to fugitive dust and because without an indication of the size of the open pit area, the DAQ can not accurately calculate fugitive dust emissions. Therefore, the NOI should describe the dimension of the open pit areas. [PB]

**R645-301-423 et seq**, Restated from Task 2910, The regulatory applicability stated on page 1 of the fugitive dust control plan is not complete. The plan should cite the regulatory applicability of the Utah Coal Rules under which the plan was requested: R645-301-423 et seq ; R645-301-244 et seq; and R645-301-526.220 et seq. • The App. 4-5 monitoring program does not address the grading requirements of R645-301-244.300 for areas other than topsoil stockpiles. •The App. 4-5 plan for fugitive dust control practices addresses the requirements of R645-301-244.100 to protect (mulch) and stabilize (tackifier) exposed surface areas (topsoil and subsoil piles and regraded areas), however, the monitoring program does not include measurements of the effectiveness of mulching and tackifier applications to control fugitive dust and erosion from exposed surface areas. • The App. 4-5 monitoring program should specify what techniques will be used to determine opacity from a non-point source (the permit boundary). •App. 4-5 states that watering records will be maintained to show the dust control measures taken. However water applications alone are not sufficient data to evaluate the effectiveness of the fugitive dust control practices. Before and after opacity readings, wind speed and direction, should also be provided to allow an evaluation of the effectiveness of the watering applications. [PB]

## COAL RECOVERY

Regulatory Reference: 30 CFR 817.59; R645-301-522.

## Analysis:

The minimum regulatory requirements of this section are as follows;

*"Underground mining activities shall be conducted so as to maximize the utilization and conservation of the coal, while utilizing the best technology currently available to maintain*

---

OPERATION PLAN

---

*environmental integrity, so that re-affecting the land in the future through surface coal mining operations is minimized”.*

Drawing 5-9, Coal Extraction Overview, indicates that the Applicant intends to leave approximately 1,207,000 tons of coal beneath the highwall.

Section 523, Mining Methods of the permit application package does not discuss coal recovery beneath the highwall by any method.

The Division is puzzled as to why Alton Coal Development would not want to recover at least some of this additional tonnage along the highwall by augering or some other mining method.

A review of Drawing 5-9 indicates a distance of approximately 100 feet or more between the surface mining coal extraction area and the proposed permit boundary for Coal Hollow.

Drawing 1-4 Coal Ownership indicates that the proposed permit area for the Coal Hollow project is surrounded by Federally owned coal on all sides, with additional Fee coal on the east side.

**Findings:**

The plan is deficient. Prior to approval, the Applicant must provide the following in accordance with:

**R645-301-522**, The Applicant must justify why they do not intend to recover coal reserves between the highwall and the edge of the proposed permit boundary (by augering or other methods) in order to maximize coal recovery and effectively utilize the resource. [PH]

**SUBSIDENCE CONTROL PLAN**

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

**Analysis:**

The Applicant met the requirements of this section. The Applicant will not subside any areas within the permit boundary because they will not use underground mining methods.

**Findings:**

The information provided in the application is considered adequate to meet the requirements of this section.

**SLIDES AND OTHER DAMAGE**

Regulatory Reference: 30 CFR Sec. 817.99; R645-301-515.

**Analysis:**

The Applicant met the requirements of this section. In Section 515.100 of the PAP, the Applicant described the procedures for contacting the Division in the event of a slide, which may have a potential adverse effect on public, property, health, safety or the environment.

In Section 515.200 of the PAP, the Applicant described the procedure for contacting the Division in the event that the Applicant's inspection of an impoundment they discover a potential hazard.

**Findings:**

The information provided in the application is considered adequate to meet the requirements of this section.

**FISH AND WILDLIFE INFORMATION**

Regulatory Reference: 30 CFR Sec. 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

**Analysis:**

**Protection and Enhancement Plan**

Task 2910 deficiencies read as follows:

*“R645-301-333, The data obtained from comparing the leks and roost sites indicates that there are sites with enough similarity that could be used for breeding and roosting areas. The applicant needs to include a methodology for relocating the birds to these alternative sites in the Alton Sage-Grouse Habitat Assessment and Mitigation Plan. • Page 20, paragraph 1, The applicant needs to describe how the “Conservation Area will be enhanced for Sage-Grouse especially during the breeding season.” • Page 20, paragraph 3, “Intact sagebrush sites will be cleared of all young Juniper trees”, these areas need to be identified. •Page 20, paragraph 3,*

*“Juniper woodlands surrounding intact stands can be cut back to increase patch size and the amount of area that has potential for nest site selection by hens,” there areas need to be identified on a vegetation map and quantified in terms of acreages. • Page 21, paragraph 3, “Long term mine plans will remove hundreds of acres of juniper woodlands”. The applicant needs to perhaps quantify this statement. How many acres per year will be removed for the development of Sage-Grouse habitat? Areas need to be listed in the application and delineated on a vegetation map. [JH]”*

*“R645-301-342, Page 23, paragraph 3, the applicant needs to describe the mechanical treatment for controlling invasive species. • Page 10, Habitat connectivity, the applicant needs to provide an update on the status of juniper removal perhaps in terms of acres of restored habitat and a map delineating the restored areas. • What is the projected time frame for providing a corridor that would connect the two populations. Endangered and Threatened Species • Page 9, Predator control paragraph 3, the applicant needs to provide an update on the status of predator control arrangements. [JH]”*

*“R645-301-358, Page 22, paragraph 3, “The Alton Sage-Grouse population will be enhanced by importing birds from nearby populations that are relatively large and stable, the applicant needs to include a time table, number of birds and appropriate clearances from DWR, USFWS, BLM. • Page 22 paragraph 3 and page 22 paragraph 1, The applicant needs to support this proposed population enhancement by differentiating the populations and providing a time table for capturing and relocating the birds as noted in the previous comment. • Page 9, Brood Rearing habitat improvement, the Division is requesting the applicant to provide an update on the status of the development of the alfalfa field in the Sage-Grouse Distribution and habitat improvement Alton, Utah. • Page 9, Brood Rearing habitat improvement paragraph 2, has the research on plant insect relationships been completed? • Page 9, Predator control paragraph 3, the applicant needs to provide an update on the status of predator control arrangements. • Page 10, Habitat connectivity, the applicant needs to provide an update on the status of juniper removal perhaps in terms of acres of restored habitat and a map delineating the restored areas. • What is the projected time frame for providing a corridor that would connect the two populations. • The application needs to include mine water consumption calculations in acre-feet per year for the four endangered fish species included in the recovery program. • The applicant needs to provide information on Bald and Golden Eagles. i.e. narrative about each species including their status within ½ mile of the proposed disturbed area. • The information on page 3-40 needs to include protection and enhancement measures for the wetland areas. • The applicant needs to include a narrative that describes how impacts to the habitat for the high value wildlife species, black bear, rocky mountain elk, and mule deer will be mitigated or enhanced during the active phase of mining operations. The applicant could describe the beneficial uses to the referenced species that have been achieved to date by the removal of the Pinyon Juniper. A comparison of acreages should be included, disturbed area footprint versus habitat enhancement, in the application. • The application needs to include vegetation and fish and wildlife information pertaining to the road realignment for the permit and adjacent areas. [JH]”*



Procedures to minimize adverse impacts to fish and wildlife are included in Volume 2, Chapter 3. Section 333, pages 3-40 through 3-49 and Appendices 3.1, 3.3 and 3.5.

Protection. The application needs to include a wildlife awareness program for the employees that includes avoidance, harassment, situations in transportation corridors, speed limits. For the affected areas within the Division's scope of responsibility, the awareness program needs to include measures to efficiently monitor, (truck drivers could maintain a log of animals hit and/or killed), and remove road kill by haul trucks, including but necessarily limited to: mule deer, elk, sage grouse, other birds and smaller animals. Further, golden and bald eagles feeding on carcasses near roads are exposed to road kill risks. Specifically, the UDWR is concerned with impacts along the State Routes 89 and 20. Although the Division's scope of authority is primarily focused on affected areas and primary haul roads an awareness program that voluntarily includes these state corridors could be included in the application. As a mitigative effort some mining companies have offered to contribute to the DWR's road kill clean up program, (personal conversation with Tony Wright, DWR raptor biologist). [JH]

The application needs to include a predator control plan that addresses how wildlife species and human activity will be managed to protect Sage Grouse.

Enhancement. There is a given assumption that wildlife species will be displaced during the active phase of mining operations. In the case of surface mining, ongoing reclamation measures are intended to offset the displacement or restore the habitat as an enhancement measure beneficial to certain wildlife populations. As noted in the previous analysis, the applicant needs to include a narrative that describes how impacts to the habitat for the high value wildlife species, black bear, rocky mountain elk, and mule deer will be mitigated or enhanced during the active phase of mining operations. Chapter 3, page 3-48, "SAGEBRUSH and OTHER HABITATS", includes some information about these species during reclamation but does not include a narrative that describes how impacts to the habitat for the high value wildlife species, black bear, rocky mountain elk, and mule deer will be mitigated or enhanced during the active phase of mining operations. The application does not include information that addresses this deficiency. The applicant could describe the beneficial uses to the referenced species that have been achieved to date by the removal of the Pinyon Juniper. A comparison of acreages should be included, disturbed area footprint versus habitat enhancement, in the application.

The main focus of the current application for protection and enhancement is the Greater Sage Grouse, listed as a sensitive species by the DWR heritage group and a candidate species by the USFWS. Appendix 3-1 "Alton Sage-Grouse Habitat Assessment and Mitigation Plan," and Appendix 3-3, "Sage-Grouse Distribution and Habitat Improvement, Alton, Utah," Appendix 3-5 "*Alton Sage-Grouse Habitat Mitigation Plan,*" and Section 333 of Chapter 3 are the main documents included in the review of this section of the regulations.

---

OPERATION PLAN

---

The data obtained from comparing the leks and roost sites indicates that there are sites with enough similarity that could be used for breeding and roosting areas.

Appendix 3-5, "Alton Sage-Grouse Habitat Assessment and Mitigation Plan"

1. Minimize impacts to the birds from mining activities

The application includes a methodology for relocating the birds to these alternative sites as noted on page 12 of appendix 3-5, appendix 3-1 and page 3-43 of chapter 3. "During the mating season decoys and calls will be used to lure the birds to alternative lek sites". DOGM and DWR can support the decoy idea; however this document reads as if it is certain to work, just work because it did for a researcher in 1978. The failure during 2008 indicates that this mitigation needs methodology improvements. In the spirit of full disclosure, this document needs to include a short summary of that effort and detail exactly how the applicant intends to improve the technique. For example, the idea to include white markings on the decoys may not work, and is based on one or two anecdotal examples. Adding white might deter the birds. It is suggest that the application includes a simple experimental design to test the techniques before excavating the lek. This could be conducted on alternative populations, but needs to be attempted on site this season. [JH]

The application needs to include a discussion of additional studies or examples where this has worked successfully or where it has been tried and failed and to compare conditions between these studies and the Coal Hollow Mine. [JH]

The mitigation plan needs to include the distances from the nearby alternative site to the existing lek or the mining activities; this information will be used to evaluate whether the action is likely to succeed based on the anticipated levels of noise and human disturbance and in comparison to the study by Eng et al. (1979). If the site is too close to mining activities, it is unlikely to succeed; however, trying to lure the birds over too great a distance may also prove ineffective. The Plan should also discuss or evaluate the habitat features of the new site and whether they are conducive to sage-grouse lekking. [JH]

The second action that may minimize impacts to birds is to stockpile spoils from mining operation up to 20 feet higher on a ridgeline, which may create a more distinct visual barrier than currently exists. This barrier between the mining activities and the conservation area may benefit the birds by blocking the view of human activities and may reduce noise levels. However, the plan needs to include an analysis of the berm for its ability to serve as a perch or hiding place for predators and/or whether the grouse consider the feature a threat. It would be helpful for evaluation purposes to understand where the ridge is located in relation to the conservation area, leks and mining areas. [JH]

2. Enhance current sage-grouse habitat

The Plan cites a study in Oregon by Bates et al. (2000) which found a significant improvement in understory productivity and diversity after removal of juniper trees, the Plan needs to include a comparison of the Alton site to the site in the Bates paper to determine if similar results be expected, or if there are substantial differences between the two sites (e.g., precipitation, climate, vegetation types) or would invasive species (e.g., cheatgrass) be of greater concern at the Alton site? [JH]

The Plan recommends complete tree removal to eliminate perches and cover for predators and to improve understory growth. Rather than using a tract excavator and dump trucks to haul the trees offsite, a brush bullhog should be used to shred the trees. This equipment will successfully remove the tree, but by mulching the trees has added benefits of providing micro-sites for greater seed germination, improve moisture retention, reduce soil erosion, and return more nutrients to the soils rather than moving nutrients offsite. In addition, there will likely be less soil disturbance by having only one piece of equipment onsite and there is less chance of introducing noxious or invasive plants since dump trucks will not be moving between sites. [JH]

The plan needs to include a commitment to conduct tree removal activities outside of the avian nesting season to avoid the take of eggs or young of other migratory birds. [JH]

The Plan contemplates mechanical sagebrush treatments in addition to removal of juniper, pine and Gambel oak; however, under certain conditions, removal of sagebrush can be detrimental to sage-grouse. There is not enough information in the Plan (e.g., location of treatments, size of treatments, need for treatments, type of treatments, or current habitat condition) to adequately evaluate the need or potential success of sagebrush removal. The Sagebrush treatments need to be specifically targeted to the needs of the local sage-grouse population and to address the limiting factors in the sagebrush habitat. Again, this information may be available in other sections of the larger document, including metrics to determine success. [JH]

### 3. Create a conservation area for the sage-grouse that will never be mined

The third goal is to establish a core sage-grouse Conservation Area that will be protected from all mining activities. The Plan needs to specify the location, size or current condition of the area. It is also unclear why was this area selected for protection, for example whether there is good sage-grouse habitat or a lack of mining resources. The Plan does anticipate the removal of trees from the Conservation Area, suggesting there is some ability to improve the habitat quality for sage-grouse. We recommend a bullhog for tree removal (see earlier comments) and that these activities occur outside of the breeding season. The Plan mentions several uses within the Conservation Area including roosting, breeding and nesting. The plan needs to include information that demonstrates that the area is large enough to support all three and if the trees are removed, will this diminish the value of the area for roosting? It is also unclear if sage-

grouse already use the area and what impact tree clearing will have on the grouse. The same is true for how grouse will respond to the mining activities. The distance of the Conservation Area from active mining activities is not specified in the Plan, nor its relation to the new lek. This information needs to be provided in order to evaluate the success of the Conservation Area. [JH]

4. Provide a corridor between north (Heut's Ranch) and south (Alton Sink Valley) populations to promote gene transfer and increase population numbers

The fourth goal is to reestablish connectivity of the grouse populations between the Alton and Heut's Ranch by removing juniper trees from approximately 1700 acres of land between these two areas. Existing studies show that there is already some movement of birds between Alton and Heut's Ranch; therefore, this action may increase future movement and/or genetic diversity; however, it is uncertain whether this action alone will result in the desired outcome. One of the purposes of this action is to facilitate a more rapid recovery of the Alton grouse population after the mining is completed (i.e., through greater connectivity); however, this assumes that there is a viable grouse population at Heut's Ranch in the future. The plan needs to include mitigation measures to protect and improve the habitat quality near Heut's Ranch. We also recommend that junipers be removed with a bullhog that grinds the trees rather than pulling and removing them. Tree removal activities should occur outside the avian nesting season. [JH]

5. Restore land disturbed by mining activities to enhance sage-grouse habitat

The Plan calls for returning the vegetation to pre-mining conditions; however, if there is an opportunity to improve habitat conditions, that should be explored. Bareroot and containerized plants should be in addition to and not in place of forbs seed. [JH]

The application needs to include a plan for monitoring the Sage grouse during the reclamation liability period. [JH]

Appendix 3-1, "Alton Sage-Grouse Habitat Assessment and Mitigation Plan"

Page 20, paragraph 1, The applicant needs to describe how the "Conservation Area will be enhanced for Sage-Grouse especially during the breeding season". The reviewer is referred to page 3-47, there is no information on this page that describes how the "Conservation Area will be enhanced for Sage-Grouse especially during the breeding season" [JH]

Page 20, paragraph 3, "Intact sagebrush sites will be cleared of all young Juniper trees", these areas need to be identified. Drawing 3-5, Sage Grouse brood habitat and Conservation area map, identifies the location of the 72 acre juniper removal plot. The intact sage brush and surrounding juniper woodland areas need to be identified. A time line for implementation needs

to be included for the removal of young junipers and the cutting back of the juniper woodlands. [JH]

Page 20, paragraph 3, "Juniper woodlands surrounding intact stands can be cut back to increase patch size and the amount of area that has potential for nest site selection by hens", there areas need to be identified on a vegetation map and quantified in terms of acreages. The application needs to include a clear, concise and comprehensive plan that includes the following criteria

- A detailed description of the project
- A map, 1"=500', that is consistent with the current vegetation maps in the application that clearly identifies the vegetation and the project area.
- Right of entry from the surface owners if other than ACDC
- A detailed description of the methodology and a time line for implementation.
- A seed mix, methodology for dispersal and rate of application.
- A description of the site restoration to prevent erosion.
- Funding

[JH]

This is the same area as the Sage Grouse brood habitat and Conservation area. Apparently there are two separate time lines.

Page 21, paragraph 3, "Long term mine plans will remove hundreds of acres of juniper woodlands". The applicant needs to perhaps quantify this statement. How many acres per year will be removed for the development of Sage-Grouse habitat? Areas need to be listed in the application and delineated on a vegetation map. Acquisition of the federal leases has no bearing on the sage grouse mitigation plan. If the plan includes mitigation efforts on federal land ACD will need to get approval from the respective agency. The application needs to include the location, acreages and a time line for removal of the junipers. [JH]

Page 22, paragraph 3, "The Alton Sage-Grouse population will be enhanced by importing birds from nearby populations that are relatively large and stable, the applicant needs to include a time table, number of birds and appropriate clearances from DWR, USFWS, BLM. Meetings with DWR, (personal conversations with Neal Perry ) indicate that transplanting birds from an alternative lek population would not be a prudent mitigation measure at this time. The appendix needs to be revised accordingly. [JH]

Page 22, paragraph 3 and page 22, paragraph 1, Meetings with DWR, (personal conversations with Neal Perry ) indicate that transplanting birds from an alternative lek population would not be a prudent mitigation measure at this time. The appendix needs to be revised accordingly. [JH]

Page 23, paragraph 3, the applicant needs to describe the mechanical treatment for controlling invasive species.

Appendix 3-3, "Sage-Grouse Distribution and habitat improvement Alton, Utah"

This document includes a mitigation plan to improve sage-grouse habitat, increase bird population levels and maintain optimal habitat for nesting, brood rearing and summer and winter use. Issues discussed include:

- Sage-grouse population and distribution monitoring,
- Results of the 2007 sage-grouse trapping and blood sampling efforts,
- Attempts to lure birds from lek to lek,
- Mitigation implementation strategies,
- Lek search and aerial habitat assessment and,
- Proposed habitat and predator control mitigation.

Page 9, Brood Rearing habitat improvement, the Division is requesting the applicant to provide an update on the status of the development of the alfalfa field. The applicant needs to describe in detail the application techniques that will be used in lieu of developing an alfalfa field for brood rearing habitat. [JH]

Page 9, Brood Rearing habitat improvement paragraph 2, has the research on plant insect relationships been completed? The research on the plant insect relationships needs to be completed and included in the application. [JH]

Page 9, Predator control paragraph 3, the applicant needs to provide an update on the status of predator control arrangements. The application needs to include a complete and adequate predator control plan, see comments under Protection and Enhancement. [JH]

Page 10, Habitat connectivity, the applicant needs to provide an update on the status of juniper removal perhaps in terms of acres of restored habitat and a map delineating the restored areas. . Pages 3 through 9, "Reestablishing Connectivity between Alton and Heut's Ranch" of the new appendix 3-5 include a general description of the connectivity project and supportive research. The application needs to include a clear, concise and comprehensive habitat connectivity plan that includes at a minimum:

- A detailed description of the project
- A map, 1"=500', that is consistent with the current vegetation maps in the application that clearly identifies the vegetation and the project area.
- Right of entry from the surface owners if other than ACDC \* note it is the responsibility of the applicant to provide that information.
- A detailed description of the methodology.
- A seed mix, methodology for dispersal and rate of application.

- A description of the site restoration to prevent erosion.
- A detailed time line for implementation
- Funding

The remaining proposed habitat conservation and mitigation efforts, items 2 through 6 noted on page 2 of appendix 3-5, the goals on page 3-42 of chapter 3, the plans described in Appendix 3-1, pages 20 through 23 and the proposed mitigation objectives outlined on pages 9 and 10 of appendix 3-3 also need to include the referenced criteria as appropriate to develop one clear, concise and comprehensive sage grouse mitigation plan. [JH]

### Chapter Three

#### Page 3-43

“...mining activities will be minimized so that the lowest disturbance will be created during the breeding season at areas adjacent to the original lek”. The term “minimized” is too subjective and “lowest disturbance needs to be defined. Technically all areas adjacent to the lek will be disturbed and there are no specific provisions to avoid the lek during the breeding season. The application needs to include a commitment not to disturb the lek during the breeding season including some buffer. [JH]

#### Page 3-43

“...In sites used by sage-grouse for breeding and roosting that had previous livestock grazing, livestock will be used post-reclamation to maintain similar vegetation characteristics as pre-mining conditions.” This logic is at best difficult to follow and the action is not acceptable as sage-grouse mitigation. Much of the “pre-mining condition” is over utilized rangeland. Indeed historic (i.e. the last 100 years) is likely at least partially the cause of long-term PJ encroachment and loss of understory components that are important for sage-grouse brood-rearing. In other words, resuming pre-mining land use will (in essence) will result in a population of sage-grouse that is “vulnerable to elimination”. Restoring this area to current land use regimes is not beneficial to an already vulnerable sage-grouse and can not be considered mitigation. The applicant needs to revise this section of the application.

Example: During the October 1, 2 tour of Robinson creek; it was obvious that the landowner actively partakes in sage-brush removal treatments (maybe the herbicide spike?). Further, excessive soil compaction and almost complete lack of understory (other than non-native cow forage like crested wheat-grass) indicate a heavily overgrazed pasture. This pre-mining land use is in now way beneficial to sage-grouse. [JH]

#### Page 3-46. Establishment of a Core Sage-Grouse Conservation Area.

The applicant needs to simply execute treatments to this area to the maximum extent feasible. These treatments take time, at least a couple of years. Given the timeline to excavate the private leases, these treatments need to happen this fall...really two falls ago, and the area needs to be rested from cattle grazing (standard is typically at least two years of resting) to ensure establishment of planted forbs and grasses. [JH]

### **Endangered and Threatened Species**

Threatened, Endangered, and Candidate plant and animal species for Kane County are included in table 3-35. As noted in Section 322.210 A narrative for each species describing the rationale for their absence and surveys conducted to verify such is included in Appendix 3-4 page 5 the application.

Threatened and Endangered Plant species are generally described in Appendix 3-4 page 5.

### **Colorado Fish Recovery Program**

According to the information in the application the proposed mining operations are not located within the boundaries of the Upper Colorado River Basin. Therefore the application would not need to include mine water consumption calculations in acre feet per year for the four endangered fish species included in the Colorado Fish Recovery program.

### **Bald and Golden Eagles**

*This section needs to include* a narrative about each species including their status within ½ mile of the proposed disturbed area. [JH]

### **Wetlands and Habitats of Unusually High Value for Fish and Wildlife**

Wetland areas are described on page 3-73 of the application and chapter 7. According to the application there are wetland areas in the permit area. Page 3-73 refers the reviewer to page 3-40 of the application for protection measures for these areas. The information on page 3-40 does not describe protection and enhancement measures for the wetland areas. [JH]

### **Findings:**

The focus of the current application for protection and enhancement is the Greater Sage Grouse, listed as a sensitive species by the DWR heritage group and a candidate species by the USFWS. Appendices 3-1, "Alton Sage Grouse Habitat Assessment and Mitigation Plan," 3-3, "Sage-Grouse Distribution and habitat improvement Alton, 3- 5 "Alton Sage-Grouse Habitat Mitigation Plan" and Section 333 of Chapter 3 are the main documents included in the review of this section of the application. These finding include consultation with the DWR and FWS.



The information is not adequate to meet the requirements of this section of the regulations. Prior to approval the following information must be provided in accordance with,

**R645-301-322.210, Bald and Golden Eagles.** This section needs to include a narrative about each species including their status within ½ mile of the proposed disturbed area.

**R645-301-330, Wetlands and Habitats of Unusually High Value for Fish and Wildlife.** Page 3-73 refers the reviewer to page 3-40 of the application for protection measures for wetland areas. The information on page 3-40 does not describe protection and enhancement measures for the wetland areas. Section 333, as noted by the Applicant, needs to include the protection and enhancement measures for wet meadow areas during active mining operations. [JH]

**R645-301-333, Protection and Enhancement Plan. Protection.** The application needs to include a wildlife awareness program for the employees that include avoidance, harassment situations in transportation corridors and speed limits. For the affected areas within the Division's scope of responsibility, the awareness program needs to include measures to efficiently monitor, (truck drivers could maintain a log of animals hit and/or killed), and remove road kill by haul trucks, including but not necessarily limited to: mule deer, elk, sage grouse, other birds and smaller animals. For example, some mining companies have offered to contribute to the DWR's road kill clean up program. • The application needs to include a predator control plan that addresses how wildlife species and human activity will be managed to protect Sage Grouse. [JH]

**R645-301-342, Protection and Enhancement Plan. Enhancement.** Chapter 3, p. 3-48, "Sagebrush and Other Habitats", includes some information about wildlife species during reclamation but does not include a narrative that describes how impacts to the habitat for the high value (crucial) wildlife species, black bear, rocky mountain elk, and mule deer will be mitigated during the active phase of mining operations. The applicant could describe the beneficial uses to the referenced species that have been achieved to date by the removal of the Pinyon Juniper. A comparison of acreages of the disturbed area footprint versus habitat enhancement should be included in the application. [JH]

**R645-301-322, -301-333, -301-342, -301-358, The following deficiencies pertain to Chapter Three.**

The application needs to include a commitment not to disturb the lek during the breeding season including some buffer. The application states on page 3-43, "...mining activities will be minimized so that the lowest disturbance will be created during the breeding season at areas adjacent to the original lek". The term "minimized" is too subjective and "lowest disturbance" needs to be defined. The

OPERATION PLAN

application must provide specific provisions to avoid the lek during the breeding season. • Livestock grazing is not acceptable as sage-grouse mitigation as suggest on p. 3-43. Example: During the October 1, 2 tour of Robinson creek; it was obvious that the landowner actively partakes in sage-brush removal treatments (maybe the herbicide spike?). Further, excessive soil compaction and almost complete lack of understory (other than non-native cow forage like crested wheat-grass) indicate a heavily overgrazed pasture. This pre-mining land use is in no way beneficial to sage-grouse. The applicant needs to revise this section of the application. •Page 3-46. Establishment of a Core Sage-Grouse Conservation Area. The applicant needs to initiate treatments to this area to the maximum extent feasible, as soon as possible. These treatments take time, at least a couple of years. Given the timeline to excavate the coal, these treatments need to happen as soon as possible, and the area needs to be rested from cattle grazing (standard is typically at least two years of resting) to ensure establishment of planted forbs and grasses. [JH]

**R645-301-322, -301-333, -301-342, -301-358, Appendix 3-1 Alton Sage-Grouse Habitat Assessment and Mitigation Plan.**

The applicant needs to describe how the Conservation Area will be enhanced for Sage-Grouse especially during the breeding season. • Areas to be cleared of young juniper trees need to be identified. • Drawing 3-5, Sage Grouse brood habitat and Conservation area map, identifies the location of the 72 acre juniper removal plot. The intact sagebrush and surrounding juniper woodland areas need to be identified. •A time line for implementation needs to be included for the removal of young junipers and the cutting back of the juniper woodlands. • Areas where "juniper woodlands surrounding intact stands can be cut back to increase patch size and the amount of area that has potential for nest site selection by hens" must be identified on a vegetation map and quantified in terms of acreages. •The application needs to include a clear, concise and comprehensive mitigation plan that includes the following criteria:

- A detailed description of the project.
- A map, 1"=500', that is consistent with the current vegetation maps in the application that clearly identifies the vegetation and the project area.
- Right of entry from the surface owners if other than ACD.
- A detailed description of the methodology and a time line for implementation.
- A seed mix, methodology for dispersal and rate of application.
- A description of the site restoration to prevent erosion.
- Funding for mitigation.

- The application needs to include the location, acreages and a time line for removal of the junipers.
- The applicant needs to include a timetable for importing Sage Grouse, the number of birds and the appropriate clearances from DWR, USFWS, BLM. [JH]

**R645-301-322, -301-333, -301-342, -301-358,** The following deficiencies pertain to Appendix 3-3, Sage-Grouse Distribution and habitat improvement Alton, Utah.

The Division requests an update on the status of the development of the alfalfa field.

- The applicant needs to describe in detail the application techniques that will be used in lieu of developing an alfalfa field for brood rearing habitat.
- The research on the plant insect relations needs to be completed and included in the application.
- The applicant needs to provide an update on the status of predator control arrangements and include a complete and adequate predator control plan, see comments under Protection and Enhancement.
- The applicant needs to provide an update on the status of juniper removal perhaps in terms of acres of restored habitat and a map delineating the restored areas.

**R645-301-322, -301-333, -301-342, and -301-358,** Repeated from Task 2910. Appendix 3- 5 Alton Sage-Grouse Habitat Mitigation Plan.

**1.) Minimize impacts to the birds from mining activities.** The application describes relocating the Sage Grouse birds to alternative sites (p. 12, App. 3-5, and App. 3-1, p. 3-43). This technique worked in 1978, but failed in 2008, indicating that this methodology needs improvement. The application needs to detail exactly how the applicant intends to improve the technique, based upon past experience. For example, the idea to include white markings on the decoys may not work, and is based on one or two anecdotal examples. Adding white might deter the birds. The application must include a simple experimental design to test the techniques before excavating the lek. This could be conducted on alternative populations, but also needs to be attempted on site, during the 2010 breeding season.

- The application needs to include a discussion of additional studies or examples where the experimental design has worked successfully or where it has been tried and failed, and a comparison of conditions between these studies and the Coal Hollow Mine.
- The mitigation plan needs to include the distances from the nearby alternative lek site to the existing lek or the mining activities. The Plan should also discuss or evaluate the habitat features of the new site and whether they are conducive to sage-grouse lekking.
- The plan needs to include a description of where the isolation berm is located in relation to the conservation area, leks and mining areas and a discussion of how the proposed isolation berm may serve as a potential perch or hiding place for predators and become a threat to the Grouse. [JH]

**2.) Enhance current sage-grouse habitat.** The Plan needs to include a comparison of the Alton site to the site in the Bates, et al (2000) paper to determine if similar results can be expected, or if there are substantial differences between the two sites (e.g., precipitation, climate, vegetation types) or would invasive species (e.g., cheatgrass) be of greater concern at the Alton site? • A brush bullhog rather than a tracked excavator and dump truck should be used to shred the trees leaving the shredded material on site. • The plan needs to include a commitment to conduct tree removal activities outside of the avian nesting season to avoid the take of eggs or young of other migratory birds. • The Plan contemplates mechanical sagebrush treatments in addition to removal of juniper, pine and Gambel oak. There is not enough information in the Plan (e.g., location of treatments, size of treatments, need for treatments, type of treatments, or current habitat condition) to adequately evaluate the need or potential success of sagebrush removal. The Sagebrush treatments need to be specifically targeted to the needs of the local sage-grouse population and to address the limiting factors in the sagebrush habitat. [JH]

**3) Create a conservation area for the sage-grouse that will never be mined.** The Plan needs to specify the location, size or current condition of the area. The application needs to include a narrative that explains why this area was selected for protection. The Plan mentions several uses within the Conservation Area including roosting, breeding and nesting. In order to evaluate the success of the Conservation Area, the plan needs to include information that answers the following questions:

Is the area large enough to support all three uses?

What is the potential for diminishing the value of the area for roosting if the trees are removed?

Do sage-grouse already use the area and what impact tree clearing will have on the grouse?

How will grouse respond to the mining activities?

What is the distance of the Conservation Area from active mining activities. This distance is not specified in the Plan, nor its relation to the new lek? [JH]

**4) Provide a corridor between north (Heut's Ranch) and south (Alton Sink Valley) populations to promote gene transfer and increase population numbers.** The plan needs to include mitigation measures to protect and improve the habitat quality near Heut's Ranch. • "Reestablishing Connectivity between Alton and Heut's Ranch," includes a general description of the connectivity project and supportive research. The application needs to include a clear, concise and comprehensive habitat connectivity plan that includes at a minimum:

- A detailed description of the project
- A map, 1"=500', that is consistent with the current vegetation maps in the application that clearly identifies the vegetation and the project area.
- Right of entry from the surface owners if other than ACD. (\*Note it is the responsibility of the applicant to provide that information.)
- A detailed description of the methodology.
- A seed mix, methodology for dispersal and rate of application.
- A description of the site restoration to prevent erosion.
- A detailed time line for implementation.
- Funding of the mitigation.

The remaining proposed habitat conservation and mitigation efforts (App 3-5, p. 2), the goals stated in Chap. 3 (p. 3-42), the plans described in App. 3-1 (p. 20 – 23), and the proposed mitigation objectives outlined in App. 3-3 (pp. 9,10) also need to include the above referenced criteria, as appropriate, and the Applicant needs to provide one clear, concise and comprehensive sage grouse mitigation plan. [JH]

**5) Restore land disturbed by mining activities to enhance sage-grouse habitat.** Bareroot and containerized plants should be planted in addition to and not in place of forb seed. •The application needs to include a plan for monitoring the Sage grouse population during the reclamation liability period. [JH]

## TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

### Analysis:

#### Topsoil Removal and Storage

Mine pits and mining sequence are described in Section 523. Overburden removal is shown on Dwg 5-16. Operational sequence and contemporaneous reclamation sequence is shown on Dwg 5-17 through 5-19.

The topsoil salvage operation is described in Section 231.100 through Section 233.100-400 and in Section Four of Appendix 2-1. Table 4-2 of Section Four in Appendix 2-1 provides the average topsoil salvage depth and the subsoil salvage depth by map unit. The topsoil salvage depth ranges from 5 to 10 inches. Subsoil suitability varies due to high pH, clay content, and carbonate accumulations. The suitable subsoil salvage depth ranges from 1 to 55 inches.

---

OPERATION PLAN

---

Due to this wide variation in suitability of subsoil the application states that topsoil and subsoil salvage will be monitored by a certified soil professional (Section 231.100 and Appendix 2-1, pg. 4-2).

Dwg. 2-2 indicates salvage and stockpiling from less than half of the permit area, with the rest of the topsoil being live-hauled to contemporaneous reclamation sites. Table 4-5 provides the expected topsoil and subsoil recovery by year and acreage disturbed. Tables 4-3.1, 4-3.2, 4-3.3 provide similar information by map unit and acreage. Table 4-4 provides topsoil and subsoil salvage for facilities construction. According to plan (Section 232.500), topsoil and subsoil from year one facilities construction areas will be stockpiled as shown on Drawing 2-2.

Three topsoil stockpiles and a subsoil pile will be located as shown on Drawing 2-2. Dwg. 2-2 describes the average depth and footprint area for each stockpile. From the information on Dwg 2-2, the combined volume of topsoil stored in stockpiles is 302,000 cu yds, of which 188,000 cu yds is topsoil. Stockpiled soil will be placed such that side slopes will not exceed 3h:1v and the piles will be bermed. The piles will be seeded with an interim mix of grasses described in Section 234.230. All totaled, the stockpiled soil will cover 17.5 acres. Stockpiles in place for less than one year will be treated with tackifier to control fugitive dust. Stockpiles in place for more than one year will be surface mulched and seeded (Section 231.100). The Applicant states in Section 234.230 that other measures approved by UDOGM may be implemented to provide stockpiles protection from wind and water erosion. The Division has established that surface roughening is the best way to prevent water erosion from occurring (see [https://fs.ogm.utah.gov/PUB/MINES/Coal\\_Related/RecMan/Reclamation\\_Manual.pdf](https://fs.ogm.utah.gov/PUB/MINES/Coal_Related/RecMan/Reclamation_Manual.pdf)). The Division previously requested (Task 2910) that the Applicant utilize surface roughening on all temporary and long term stockpiles of spoil, topsoil and subsoil). This request is repeated below.

**Findings:**

The information provided in the application does not meet the requirements of the R645 Coal Rules for Soils Handling Operation Plan. Prior to approval, please provide the following, in accordance with:

**R645-301-244.100,** The Applicant states in Section 234.230 that other measures approved by UDOGM may be implemented to provide stockpiles protection from wind and water erosion. The Division has established that surface roughening is an effective way to prevent water erosion from occurring on steep slopes (see [https://fs.ogm.utah.gov/PUB/MINES/Coal\\_Related/RecMan/Reclamation\\_Manual.pdf](https://fs.ogm.utah.gov/PUB/MINES/Coal_Related/RecMan/Reclamation_Manual.pdf)). The Applicant must describe the use of surface roughening on all temporary and long term stockpiles (spoil, topsoil and subsoil piles). This request repeated from Task 2910 review. [PB]

## VEGETATION

Regulatory Reference: R645-301-330, -301-331, -301-332.

### Analysis:

Vegetation communities are described in Volume 2, Chapter three of the application. The descriptions include acreage, percent of total by community, total living cover, percent cover by shrubs, grasses, forbs and woody plant species, for;

- The proposed Disturbed Sagebrush/Grass Community
- The Sagebrush/Grass Reference Area
- The Proposed Disturbed Meadow (Dry) Community
- The Meadow (Dry) Reference Area
- The Proposed Disturbed Pinyon-Juniper Community
- The Pinyon-Juniper Reference Area
- The Proposed Disturbed Pasture Land Community
- The Pasture Land Reference Area
- The Proposed Disturbed Oak brush Community
- The Oak Brush Reference Area
- The Proposed Disturbed Meadow Community
- The Meadow Reference Area
- Other Meadow Communities

Tables 3-1 through 3-33 include living cover and frequency by plant species, total cover and composition and woody species density. Table 3-34 includes "Biomass Production of Plant Communities in the Coal Hollow Permit Area". These figures are represented in pounds per acre for each community.

Appendices 3-2 and 3-4 include the methodologies, (maps, sampling design and transect/quadrat placement, cover and composition, woody species density, sample size and adequacy, statistical analyses, photographs and threatened and endangered plant species), results, summary and discussion and color photographs for the referenced communities.

On page 15, Threatened & Endangered Plant Species Survey, the applicant needs to include a description of the T&E plant species survey, and a narrative that describes the species, location, elevation, soil type, moisture requirements, and the presence or absence of each species. Threatened and Endangered Plant species are described in Appendix 3-4 page 5. The reviewer is referred to Chapter 3, Section 333, Procedures to Minimize Adverse Impacts to Fish and Wildlife. There is no information in this section that describes the protection and enhancement measures for wet meadow areas.

**Findings:**

The information is not adequate to meet the requirements of this section of the regulations. See deficiency concerning protection and enhancement measures for wet meadows written under R645-301-330.

**ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES**

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

**Analysis:****Road Classification System**

Task 2910 deficiency: **R645-301-527.100**; *"The Applicant must state specifically which roads will be classified as primary roads and which roads will be classified as ancillary. The Division will not accept a blanket statement that all future roads will be ancillary. In addition, some roads that are not used to haul coal or spoil might be primary roads. In addition, the Applicant must also classify the road that connects the site with Kane County Road # 136."*

The Permittee has classified two roads for the coal extraction process; "Year 1 and 2 Mine Haul Road", and "Year 2 and 3 Mine Haul Road". This road classification is discussed in section 527.100, Chapter 5, page 5-33. These roads will provide access into and from the mining pits during the coal extraction process. Drawings 5-22 and 5-23 show details of the two haul roads.

The "Facilities Roadway," is the access to the mine facilities area and is described as a primary road. Details of this road are depicted on Drawing 5-22A and 5-22B.

Section 527.100 classifies seven individual roads as primary. Drawings 5-22A through 5-22G have been added to show details for primary roads. Drawings 5-35 and 5-37 have been revised to show the post-mining roads along with the post-mining topography.

The Sink Valley Road, K3900, is a Class "B" road under RS2477 designation.

**Plans and Drawings**

Appendix 1-7 includes information about the relocation of County Road 136.



The Task 2910 review generated the following deficiency; *"The Applicant was not consistent with the description of the road surface,"* because Dwg 23, Primary Mine Haul Roads Cross Section and Detail, did not previously show the eighteen inches of crushed rock or gravel mentioned in section 534.100-200 of the PAP.

The applicant has adequately addressed this deficiency. The Applicant has updated Drawing 5-23 to be consistent with the description provided in 534.100-200. Typical Cross Section NTS contains a note below the cross-section; *"18 " (inches) of Crushed Rock or Gravel to be Placed"*.

The Applicant is required to include plans and drawings for each road that contain the following:

- A map, appropriate cross sections, design drawings, and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, low-water crossings, and drainage structures. The Applicant shows the basic designs for the primary roads in Section 527.170 and on Drawing 22 and Drawing 23. The Applicant provided the information listed above. For clarity each road must have its own identification name or number.
- Drawings and specifications of each proposed road that is located in the channel of an intermittent or perennial stream. The Applicant gave the designs for the stream crossings in Section 527.170 and on Drawing 22 and Drawing 23.
- Drawings and specifications for each proposed ford of perennial or intermittent streams that are used as a temporary route. The Applicant does not propose to have temporary routes thru perennial or intermittent streams.
- Measures to be taken to obtain approval of the Division for alteration or relocation of a natural stream channel. In Section 527.220 of the PAP, the Applicant states that there will be no stream diversions for road construction. The Applicant then goes on to state that a permanent diversion will occur in Lower Robinson Creek, consistent with information presented on Drawing 22. The Applicant should modify the comment in Section 527.200 of the PAP to acknowledge that there will be a permanent diversion in Lower Robinson Creek to allow for maximum economic recovery, but not to facilitate road construction.
- Drawings and specifications for each low-water crossing of perennial or intermittent stream channels. In Section 534.100-200 of the PAP, the Applicant states that they will not do such activities.

In addition to the above, the Applicant will provide primary roads shall meet the following requirements for primary roads:

- A qualified registered professional engineer shall certify the construction or reconstruction of primary roads in a report to the Division. The certified designs are on Drawing 22 and Drawing 23.

---

OPERATION PLAN

---

- Each primary road embankment shall have a minimum static factor of 1.3. The Applicant states in Section 534.100-200, that all embankments have been designed with a 1.3 static safety factor.
- Primary roads shall be located to minimize erosion, insofar as is practicable, on the most stable available surface. In Section 534.100-200, the Applicant states the design plans. The Applicant complied with the general rules that are designed to help insure the above mentioned requirements are met.
- Fords of perennial or intermittent streams by primary roads are prohibited unless the Division specifically approves them. The Applicant does not plan to use fords in any stream.
- Each primary road shall be constructed or reconstructed, and maintained to have adequate drainage control. The Division considers that those general requirements have been met if the hydrology requirements have been met.
- Primary roads shall be surfaced with material approved by the Division as being sufficiently durable for the anticipated volume of traffic and the weight and speed of vehicles using the road. The Applicant was not consistent with the description of the road surface. In Section 534.100-200, the Applicant stated that eighteen inches of crushed rock or gravel would be used for road surfacing. On Drawing 23, the Applicant does not list eighteen inches of road surface and states that gravel will be placed as needed.

The Division received several comments about truck travel through Panguitch. Some people would prefer that the truck traffic be routed around the town either by having the Applicant use alternative routes or by have a bypass road constructed. The Division does not regulate truck travel on public roads. The Division will forward the comments onto the Department of Transportation.

The Division received comments about commitments that the Applicant allegedly made about constructing a bypass road around Alton. The Applicant did not include that information in the submittal. The Division does regulate truck traffic on public roads including those through Alton. The Applicant did not indicate that any new roads will be constructed in this application, which the exception of the road realignment.

The Division received comments about coal being blown off the trucks as they travel on public roads. Truck traffic on public roads is regulated by the Department of Transportation. The Department of Transportation is responsible for ensuring that all truckloads are properly covered.

### **Performance Standards**

The Applicant meet the requirements of this section. All roads road shall be located, designed, constructed, reconstructed, used, maintained, and reclaimed so as to:

- Control or prevent erosion, siltation, and the air pollution attendant to erosion, including road dust and dust occurring on other exposed surfaces. In Section 534.100-200 and 534-300-340, the Applicant discusses those requirements.
- Control or prevent damage to fish, wildlife, or other habitat and related environmental values. The Division considers that the general requirements are met if the biology requirements have been met.
- Control or prevent additional contributions of suspended solids to streamflow or runoff outside the permit area. The Division considers that those requirements have been met if the hydrology requirements have been met.
- Neither cause nor contribute to, directly or indirectly, the violation of State or Federal water quality standard applicable to receiving waters. The Division considers that those requirements have been met if the hydrology requirements have been met.
- Refrain from seriously altering the normal flow of water in streambeds or drainage channels. The Division considers that those requirements have been met if the hydrology requirements have been met.
- Not locate any road in the channel of an intermittent or perennial stream unless specifically approved by the Division. In Section 534.100-200 and 534-300-340, the Applicant states that roads will not be located in stream channels.
- Prevent or control damage to public or private property, including the prevention or mitigation of adverse effects on lands within the boundaries of units of the National Park System, the National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, including designated study rivers, and National Recreation Areas designated by Act of Congress. The Division considers that those requirements are met if the hydrology and biology requirements have been met.
- Use nonacid- and nontoxic-forming substances in road surfacing. In Section 534.100-200, the Applicant committed to that requirement.
- Maintain all roads to meet the performance standards of this part and any additional criteria specified by the Division. In Section 534.340 and Section 527.230, the Applicant committed to that requirement.
- A road damaged by a catastrophic event, such as a flood or earthquake, shall be repaired as soon as is practicable after the damage has occurred. The Applicant addresses that requirement in Section 527.230.

### **Primary Road Certification**

All drawings provided by the Applicant which are relative to road specifications have been certified by Mr. Chris McCourt, Utah registered professional engineer.

All primary roads which will be constructed or re-constructed must receive professional engineer certification that they have been constructed according to the approved plans after they

---

OPERATION PLAN

---

have been completed. This requirement is particularly pertinent to the re-construction of Kane County Road #136 (K3900).

### **Other Transportation Facilities**

The task 2910 review generated the following deficiency; *"The Applicant should modify the comment in section 527.200 of the PAP that states "As currently planned, no natural drainage ways will be altered or re-located due to road construction," to acknowledge that there will be a permanent diversion in Lower Robinson Creek to allow for maximum economic recovery, but not to facilitate road construction"*.

The applicant has adequately addressed this deficiency by adding text to section 527.220 (Chapter 5, page 5-35) to clarify that Lower Robinson Creek will be temporarily diverted in order to maximize the economic recovery of coal from that area and not to facilitate road construction.

### **Findings:**

The Applicant has adequately addressed the deficiencies identified in the Task ID # 2910 written on August 8, 2008. The information provided in the application meets the requirements of this section.

## **SPOIL AND WASTE MATERIALS**

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

### **Analysis:**

#### **Disposal Of Noncoal Mine Wastes**

The Applicant met the requirements of this section. The Applicant outlined how they would comply with these regulations in Section 528.330 through Section 528.334.

#### **Coal Mine Waste**

The Applicant met the requirements of this section. The Applicant stated in Section 528.320 "Not Applicable". The Applicant does not anticipate that coal mine waste will be produced at the site. Coal mine waste is defined in R645-100 as coal processing waste and underground development waste. The Applicant does not anticipate underground development waste because only surface mining will be done and no coal processing (other than crushing and screening) will occur on the site.

### **Refuse Piles**

The Applicant met the requirements of this section. The Applicant stated in several area of the PAP, including Section 528.320 that no refuse pile would be needed.

### **Impounding Structures**

The Applicant will not construct impounding structures of coal mine waste.

Chapter 5, pages 5-47 through 5-49 discuss the five sediment impoundments which will control and treat runoff from the disturbed area. A geotechnic analysis of the impounding embankments for these structures is contained in Appendix 5-1. The minimum long term static safety factors for these ponds ranges from 2.2 to 5.3 (minimum requirement 1.3).

**R645-301-533.200;** Foundation preparation and construction is addressed in section 533.200, page 5-48.

**R645-301-533.300;** An analysis of the affects of a rapid draw down on the pond embankments is contained in Appendix 5-1. The analysis says that no additional protection measures are needed for the impounding embankments should a naturally occurring rapid drawdown of the pond water volumes occur. The resulting safety factors for the embankments range from 1.2 to 1.9.

### **Coal Processing Waste Dams and Embankments**

The proposed mine plan does not anticipate the construction of any coal processing waste dams and embankments (See Chapter 5, page 5-3).

### **Burning And Burned Waste Utilization**

The Applicant met the requirements of this section. The Applicant will not have coal mine waste at the site. See Section 528.320

### **Return of Coal Processing Waste to Abandoned Underground Workings**

There are no underground workings at the site.

### **Excess Spoil:**

The Applicant did not meet the requirements of this section. The Applicant described how the excess spoil would be handled in several sections of the PAP, including, 526, 528, 535, and 536.

The pre-topographic maps and the reclamation maps show that the Applicant located the spoil pile in naturally stable areas. Drawing 5-3 and 5-35 show the areas where excess spoil will be placed. Drawings 5-35 and 5-36 show the design of the fill. Appendix 5-1 is a geotechnical analysis of the sediment impoundments and excess spoil structure prepared by Taylor Geo-Engineering, LLC. The Applicant does not plan on disposing of coal mine waste in the excess spoil pile (521.143).

The excess spoil pile is designed to minimize effects on surface and ground water due to leaching and surface water runoff: design details are in Section 535 (745.100). A spring and seep survey identified no springs or wet weather seeps in the proposed excess spoil area. The location for the excess spoil pile encompasses an area of dry meadow west of County Rd. 136 (shown on Plate 3-1). This area is identified potentially sub-irrigated (App. 7-7 (pg. 10)). The soil in dry meadow area is map unit 6 (Graystone-Cookcan-Jonale Family complex, 1 – 5% slopes) which is described in Chap. 2, page 13 as medium to coarse textured soil with wet conditions. No underdrains are planned for the excess spoil structure. The final surface of the excess spoil pile will be regraded to a contour that will route water from snowmelt and rainfall around the excess spoil (Drawing 5-35). No manmade water courses are present in the excess spoil area (745.100). Although Appendix 5-1, Slope Stability Analysis for Proposed Excess Spoil Structure and Sediment Impoundments states that the eastern 1/3 of the spoil pile can be constructed up to 90 feet in height and up to 120 feet on the western 2/3 portion with 3H:1V slopes, the actual finished design will only climb to a height of 75 to 86 feet on the east end.

Section 535, p. 5-52 states, "Excess spoil will be placed in designated disposal areas within the permit area in a controlled manner. The fill and appurtenant structures will be designed using current, prudent engineering practices and will meet any design criteria established by the Division".

Task 2910 deficiency: R645-301-535.140, *"In Section 528.310 and 535.100, the Applicant states that spoil will be placed in lifts not to exceed four feet in thickness and meet a 90% compaction based on the standard Proctor tests. The Applicant needs to provide the Division with the specifications of the equipment that will be doing the compaction. The Division is unaware of any equipment that can compact lifts up to four feet thick and achieve a 90 % Proctor."*

The Applicant provides a revised geotechnical analysis for sediment pond embankments and excess spoil pile in Appendix 5-1, based on the revised design of the spoil. "The revised design of the excess spoil and fill above approximate original contour provides concave slopes that grade from 5h:1v to 4h:1v to 3h:1v, bottom to top. This change in the slope design has allowed for lowering the compaction specification of the spoil to 85 %."

Appendix 5-1 states that laboratory testing of the proposed fill materials was completed at 90 percent of the standard Proctor, which confirms that a 90 % Proctor standard can be met. Previously, a standard Proctor of 90 % was required where minimum long-term static safety factors are called for in the Coal Mining Rules. However, the federal regulations were revised to eliminate the minimum 90% requirement for Proctor, as long as professional engineers were willing to certify, in the required constructions inspections, that adequate compaction was being attained to meet the 1.3 or 1.5 static safety requirement.

The 85% Proctor specification will be met by the method of construction and the equipment used (p. 5-52). Large haul trucks (100 to 240 ton) will dump the dirt in place on each lift and a dozer(s) will spread the spoil into four foot lifts. The spreading process will require tracking over the spoil lift repeatedly with the dozer (D10 to D11 size). In addition, most of the spoil lift will also be repeatedly traveled over by the large haul trucks in order to place the material on each lift. The pressure exerted on the four foot lifts from the large mining equipment will provide sufficient compaction to meet the 85% specification. Text in Sections 528.310 and 535.100 has been revised to reflect the revised 85% compaction specification.

Based upon the plan view depicted on Drawing 5-3, it appears that approximately sixty percent of the excess spoil volume will be placed in the coal recovery or "pit" area. Lift thicknesses and grades will be monitored such that they do not exceed the four foot thickness requirement by using GPS technology.

Section 528.310, p. 5-11 describes the method to be used to handle excess spoil generated by the project. Final slopes will be regraded to a maximum slope of 3h:1v. The top of the fill will be sloped to approximately 2 % to prevent pooling of water and to re-establish drainage to original flow patterns. Refer to Drawings 5-3 and 5-35 in the PAP. The spoil will be placed with dump trucks. Then, dozers will be used to spread the material into four foot lifts. The fill will meet at minimum 85% compaction as related to the standard Proctor. The Applicant does not state how the standard 85% Proctor will be confirmed. Proctor compaction is one of the standards used to determine whether the fill design will meet the minimum static safety factor of 1.5,. Therefore the Applicant must describe how the professional engineer will determine that the minimum 85% Proctor is being met.

The Applicant must specify how the professional engineer will confirm that adequate compaction requirements (Proctor standard) will be met (i.e., by nuclear density examination, or other means) as part of the required periodic inspections mandated under R645-301-514.100, 514.311, and R645-301-514.120. Appendix 5-1, page 8 of 9, section 8.0 Recommendations, of

---

OPERATION PLAN

---

the Taylor Geo-Engineering slope stability analysis for the spoil fills (85% Proctor) and sediment pond embankment stability (90% Proctor), states that an engineer should be present to periodically verify the placement and compaction of fill materials in accordance with Appendix F of the geotechnical report and the State of Utah R645 Coal Mining Rules.

Appendix F contains Recommended Earthwork Specifications authored by Taylor Geo-Tech Engineering. Appendix F discusses monitoring of design specifications for the cuts and fills associated with the excess spoil pile construction and the sediment pond embankments to confirm that adequate compaction is being performed during the construction processes. Nine procedure recommendations are listed. Saturated soils should be placed in areas where they will have little to no effect on the stability of the filled area. Native soils will be ripped to a minimum of twelve inches where they will form the sub-grades for pond embankments.

The application is deficient. The permit applicant must commit to adhering to the construction recommendations contained in APPENDIX F during the construction activities for the spoil fills and sediment pond embankment construction periods. These are relative to establishment and determination that the minimum static safety factor of 1.5 can be met for spoil fills and a 1.3 can be met for embankments..

**Findings:**

R645-301-514.100 and 514.120 require regular inspections during construction and placement of fill and confirmation that the fill has been constructed and maintained as designed and in accordance with the approved plan. A critical component of meeting the minimum required 1.5 long term static safety factor is compaction, and the Applicant has not stated how the professionally certified State of Utah engineer will confirm that the 85 % Proctor compaction standard will be confirmed. This confirmation of adequate compaction information must be provided as part of the inspection report provided to the Division under R645-301-514.120

The information provided in the application is not considered adequate to meet the requirements of this section. Before approval, the Applicant must provide the following in accordance with:

**R645-301-514.100 and -514.120,** The Applicant must commit to regular inspections of lift thickness and compaction density during placement and compaction of fill materials. The Applicant must provide confirmation that compaction requirements meeting the minimum 85 % Proctor standard are being met as designated within the Taylor Geo-Tech slope stability analysis for spoil fill areas. •The inspection report must include a description of the test method that was used to determine that adequate compaction is being obtained as the fill is being placed. •The inspection report must include all other standard engineering test methods used to determine that a minimum long term static safety factor of 1.5 can and will be



achieved. •The report must include any appearances of instability, structural weakness, and other hazardous conditions. [PH]

**R645-301-535.100**, This rule requires that the fill be designed. The Applicant must commit to meeting all of the recommended earthwork specifications contained in Appendix F for spoil fills and impoundment embankments. This can be done by reference to the Appendix in Chapter 5, Section 528.310. • Rather than stating that “excess spoil will be...concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction, “ the Applicant must specify how the Professional Engineer will confirm that adequate compaction requirements (Proctor standard) will be met (i.e., by nuclear density examination, or other means) as part of the required periodic inspections mandated under R645-301-514.100, 514.311, and R645-301-514.120. [PH]

## MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

### Analysis:

Commitments in Sections 513.500, 529, 541, 542.700, 551, 731, 738, 748, 755, and 765 to meet the requirements of the Coal Mining Rules for managing Mine Openings, including exploration bore holes, water wells, and monitoring wells. Sections 513.500, 529, 541.100-400, 542.700, 551, 731, 738, 748, 755, and 765 outline the procedure that will be used for abandonment and closure of wells, including exploration holes and boreholes used for water wells or monitoring wells.

### Findings:

Information on Mine Openings meets the requirements of the Coal Mining Rules.

## HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

### Analysis:

## General

Figure 19 (App. 7-1) illustrates the groundwater recharge areas of Sink Valley. The minesite is divided into two drainages. Runoff from Dry Fork and Lower Robinson Creek drain across the northwest side of the mine permit area, while the south east half is supplied by several sub drainages in the Sink Valley drainage.

Groundwater interception along the eastern edge of the proposed mine permit could have a substantial influence on the function of the ground water system in Sink Valley. Potentiometric surface levels in Drawing 7-13, the groundwater cross-sections associated with Figure 6-a in the Peterson Report as well as Figure 16, cross-sections in Figures 6, 7 and 8, the flow pattern in Sink Valley Wash shown in Figure 21, the alluvial groundwater discharge area in Figure 16, and the drawdown and recovery data shown in Figures 17 and 18, all paint a picture of the groundwater resources on and adjacent to the minesite.

The eastern edge of the pits will intercept alluvial aquifers that support numerous springs, wells, and subirrigated lands. Most of the groundwater activity lies east of the fault the lies on the east side for the mine permit area. The fault is not the controlling factor in groundwater movement. It is only linked to groundwater conditions in as much as it offsets the strata some 10 to 30 feet higher on the east than the west. The offset in combination with the regional dip of the strata create the trough of Sink Valley.

There is probably going to be drainage from these alluvial aquifers into the pits ; being most probable when the Tropic Shale Ridge is breached during the development and mining of Pits 13, 13, and 15.. When mining is done in each pit, it is to be filled and reclaimed. Porous fill material must not be left adjacent to the alluvial aquifers, because that would facilitate continuous drainage from the aquifers into the fill in the pits. A grout curtain or geomembrane would be possible methods of blocking ground-water flow across this boundary, but the Applicant may devise other methods to achieve this purpose. The applicant must provide a design for the margin, where the pits meet the undisturbed alluvium. Specific techniques to be used to minimize drainage from the alluvium into the fill in the reclaimed pits.

In the cover letter for the December 2008 submittal, the Applicant states that this has been addressed, but the information could not be found in Chapters 5 or 7.

## **Groundwater Monitoring**

The applicant presents some water quality data collected by Utah International during 1987 and 1988, for their mine application. The applicant began monitoring baseline groundwater conditions in mid to late 2005 and continues today. Data has been sent to the DOGM Water Quality Database. Some of the same data is presented in the Petersen Hydrologic Report in Appendix 7-1. The Division has produced tables from the database, which reflect the accumulation of surface and groundwater data through the first quarter of 2008.

The applicant plans to continue monitoring springs and wells throughout the mining and reclamation operation mining operations. Drawing 7-1 shows locations for seeps and springs.

Section 731.200 provides a groundwater monitoring plan that describes the baseline monitoring activities as shown in Table 7-1. At the end of the hydrology section is a list of baseline monitoring sites for springs, streams, wells and alluvial trenches. Table 7-2 identifies details of monitoring wells, which include the well number, date drilled, screened formation, collar elevation, depth of well, depth of bedrock, and screened interval. Table 7-4 identifies the monitoring protocols for the monitoring sites. Table 7-5 also provides a list of monitoring sites and gives a brief description of their location. Tables 7-7a and 7-7b identify the water quality parameters the applicant has proposed to monitor for groundwater operational and baseline conditions.

## **Springs**

The applicant has monitored springs for field parameters and water quality. Springs SP-3, SP-4, SP-5, SP-6, SP-8 and SP-33, Johnson Spring, are identified on the baseline monitoring map, Dwg 7-2. The database shows five springs (SP-3, SP-4, SP-6, SP-8 and SP-33, Johnson Spring) were monitored for field parameters and water quality from mid 2005 to the first quarter 2008. Springs SP-3 and SP-4 were not originally proposed as full-suite water quality monitoring sites, p7-45. Several other springs are monitored for discharge and field parameters. Table 7-5 shows SP-3 is to be monitored for quality, but SP-4 is to be monitored only for field parameters.

The text identifies eight springs in the alluvial system that will be monitored for groundwater, (SP-8, SP-14, SP-16, SP-19, SP-20, SP-22, SP-24 and SP-40 (Sorensen Spring). SP-8 will be monitored quarterly for discharge and operational laboratory water quality. Springs SP-14, SP-16, SP-19, SP-20, SP-22, SP-24 and Sorensen Spring will be monitored for discharge and field water quality measurements. SP-15, SP-17, SP-18, SP-21, SP-23, SP-25, SP-26, SP-27, SP-28, SP-29, SP-30, SP-31, SP-34, SP-35, SP-36 and SP-37 are identified as monitoring springs in Table 7-1, but are not shown on Dwg 7-2 or discussed in the text. Spring 23 is listed in Table 7-5 as a monitoring site, where field and quality parameters should be collected. The Applicant should insure all tables and text correlate to each other. The tables at the end of Section 7 are the same as a set of tables in Appendix 7, Petersen Hydrologic, LLC report. The drawings in the Petersen Report show different water monitoring locations than the drawings in

---

OPERATION PLAN

---

the text. The applicant should make sure all groundwater monitoring sites are located on the groundwater monitoring map and their protocols are represented on the map and legend. The text, maps (including legend) and tables, all need to be consistent and correlate with each other, see deficiency written under R645-301-724.100 in the Environmental Resources/Hydrology section of this technical analysis.

### **Wells**

The applicant identifies a monitoring plan for wells in Section 731.200. Wells Y-61, LS-85, SS-30, UR-70 and LR-45 will be monitored quarterly for groundwater operational laboratory water quality parameters, which is Table 7-7A. Wells Y-98, Y-45, Y-102, Y-36, Y-38, C5-130, C2-15, C2-28, C2-40, C3-15, C3-30, C3-40, C4-50, C7-20, C9-25, C9-40, LS-28, LS-60, LS-85, SS-15, SS-30, SS-75 CO-18 and CO-54 will be monitored quarterly for water level. Of these springs Y-98, Y-99, Y-102, Y-36, Y-61, Y-59, Y-45, Y-38 and Y-63 are identified on the monitoring map, Drawing 7-2. Drawing 7-11 shows the typical design of a monitoring well.

### **Surface Water Monitoring**

Drawing 7-1 shows locations for streams in and adjacent to the proposed permit and adjacent area; Drawing 7-7 shows locations for a number of small ponds created to impound runoff and spring discharge for stockwatering and irrigation, and conveyance ditches. The drawing base for both drawings, the Alton USGS Topographic Quad, shows numerous small ponds that generally coincide with the ponds marked by the Applicant on Drawing 7-7, although the Applicant has identified ponds that are not shown on the basemap. Section 722.200 states there are no significant natural ponds or lakes.

The surface water monitoring plan is summarized in Tables 7-4 through 7-7b.

The Division received a comment that the water monitoring plan was not complete because baseline information was not complete. As has already been discussed, there are some deficiencies in the baseline data that need to be rectified, but on the whole the baseline data provide sufficient understanding of the hydrology of the proposed permit and adjacent area to prepare a surface-water monitoring plan.

### **Acid- and Toxic-Forming Materials and Underground Development Waste**

Appendix 6-2 contains information on the acid- and toxic-forming potential of earth materials naturally present in the proposed permit and adjacent areas. Appendix 6-1 (confidential binder) has information on the Smirl Coal Seam proposed for mining.

The Division received a comment that there were no analyses identifying strata that might contain acid- and toxic forming materials from the Dakota Formation (R645-301-624.220). The data referred to in the preceding paragraph meet this requirement.

Only the alluvial to a maximum depth of 30 feet overburden is being considered for surface placement, according to Section 232.720. Section C Appendix 2-1 show all surface soil analysis of hot water soluble selenium below limits of detection, 0.02 mg/kg. Appendix 6-2 shows selenium content of less than 0.10 mg/kg in the overburden cores using method SW6020 for water soluble selenium, with the exception of the zone below the coal and below 35 feet in the vicinity of CH-06-05, where insufficient sample provides no information on selenium levels and/or high levels of selenium in the lower zones of overburden require special handling. Since only the upper 30 feet of overburden will be returned to the surface, there should be no selenium impacts to vegetation or grazing animals.

To ensure that selenium levels are adequately represented by the six core holes and that selenium levels in the surface and in the submerged water table remain low, the Division will require a selenium monitoring plan for soils and overburden during final placement. Please refer to Attachment 1 of the Division's 2008 Guidelines for Topsoil and Overburden Handling when writing the Coal Hollow selenium monitoring plan. Monitoring requirements for selenium in the water table is permit specific. Please refer to Attachment 1 of the Division's 2008 Guidelines for Topsoil and Overburden Handling.

Section 728.332 describes the expected selenium hazard. In addition Section 728.332 states that Wyoming considers a value of 0.3 mg/kg selenium as suitable and between 0.3 and 0.8 mg/kg selenium as marginally suitable for topsoil and topsoil substitute. This statement fails to recognize that these concentrations are for upland areas (not agricultural areas) and that post-reclamation monitoring of selenium concentrations are required for such levels of selenium (<http://deq.state.wy.us/lqd/guidelns/guide1.pdf>).

Section 731 describes the measures to be taken to protect the surface and ground water from wash water, chemicals, fuels, and oils and from sediment load.

### **Transfer of Wells**

The Applicant commits in Sections 738, 748, 755, and 765 that, when no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under the Coal Mining Rules, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with the Coal Mining Rules.

### **Discharges Into An Underground Mine**

There are no underground mines in the area.

### **Gravity Discharges From Underground Mines**

There are no underground mines in the area.

### **Water-Quality Standards And Effluent Limitations**

The Applicant has committed to apply for a UPDES permit (Section 728.332) to discharge from the mine pit, to either Lower Robinson Creek or Sink Valley Wash, which are both tributary to Kanab Creek. Supplemental containment and sedimentation ponds will be built if needed to meet effluent discharge standards (Section 724.500).

#### **Diversions: General**

Drawing 5-3 shows the proposed locations for the sedimentation ponds, ditches, and other sediment control measures. Drawing 5-25 shows the location of. Drawing 5-27 shows the drainages reporting to the sediment control diversion ditches. Details of sediment control diversion ditch construction are on Drawings 5-33 and 5-34.

#### **Diversions: Perennial and Intermittent Streams**

Drawings 5-20 and 5-21 show plans for the Robinson Creek diversion. This is planned to be a temporary diversion. See previous comments on the inappropriateness of this as a permanent diversion

#### **Diversions: Miscellaneous Flows**

Diversion of miscellaneous flows is planned using four diversion ditches. Two will be primarily used to route runoff from upland, undisturbed areas away from the planned disturbed areas, and the other two are planned to direct runoff from disturbed areas into sediment impoundments. Drawings 5-27, 5-33 and 5-34 show the locations of these diversions, along with the associated watersheds. Appendix 7-2 contains the calculations related to these diversions.

### **Stream Buffer Zones**

The application commits that any perennial or intermittent stream (which includes ephemeral streams that drain a watershed of at least one square mile) in the mine area will be protected by 100-foot stream buffer zones on either side (731.600). Areas surrounding the streams that are not to be disturbed will be designated as buffer zones, and will be marked as specified in R645-301-521.260.

In order to allow any proposed operations inside a stream buffer zone, the Division will need to make a finding that coal mining and reclamation operations will not cause or contribute to the violation of applicable Utah or federal water standards and will not adversely affect the

water quality and quantity or other environmental resources of the stream: the Division has not made such a determination at this time.

As currently proposed, the plan calls for the temporary diversion of a reach of the Lower Robinson Creek stream channel, approximately 2,000 feet in length, in the southeast 1/4 of Section 19, T. 39 S., R. 5 W. Details of the proposed diversion are given in Chapter 5, Section 527.220 of this MRP. The Division does not see the need or purpose to make such an unnatural and unstable relocation of this channel permanent: see previous comments

### **Sediment Control Measures**

The applicant states that sediment control measures have been designed, constructed and maintained to prevent additional contributions of sediment to stream flow or to runoff outside the permit area (Section 732). The Applicant proposes four diversion ditches and four sediment impoundments for the proposed permit area. Specific areas will be treated by additional miscellaneous controls such as silt fence and berms. The proposed locations for these structures are shown on Drawing 5-3. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2.

The Applicant proposes cut ditches on the shoulders of all primary roads to control drainage and erosion. Cut and fill slopes along the primary roads will be minimal and are not expected to cause significant erosion. In locations where there are culvert crossings (i.e. Lower Robinson Creek), the fill slopes will be stabilized by utilizing standard methods such as grass matting or straw wattles. The location and details for roads can be viewed on Drawings 5-3 and 5-22 through 5-24.

Sediment control measures are to be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-760 in the application. Siltation structures and diversions will be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-763 (Section 731).

Storm water and snow melt within the facilities area is to be routed to a sedimentation pond. This pond is to have a drop-pipe spillway installed to allow removal of oil sheens by using absorbent materials. Drawing 5-28 shows the details for this impoundment (Section 731).

### **Siltation Structures: General**

#### **Siltation Structures: Sedimentation Ponds**

Drawing 5-3 shows the planned location of each sedimentation pond. Particulate matter will be allowed to settle prior to the discharging of the water to the receiving water, controlling suspended solids concentrations (728.322). Appendix 5-2 contains sizing calculations for the sedimentation ponds; Appendix 5-3 contains sizing calculations for culverts, and both Appendices 5-2 and 5-3 include sizing data for diversions. Sediment control facilities will be designed and constructed to be geotechnically stable (728.333).

---

**OPERATION PLAN**

---

Drawing 5-25 shows the location of sedimentation ponds, and Drawing 5-26 shows the drainages reporting to the sedimentation ponds. Drawings 5-28 to 5-31 show designs for construction of the sedimentation ponds. Drawings 5-32 shows design details for the spillways.

The planned sedimentation ponds are small enough that they do not need to meet the requirements of MSHA, 30 CFR 77.216(a). The applicant commits that should any impoundments and sedimentation ponds that meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a) be built, the ponds will meet those criteria.

**Siltation Structures: Other Treatment Facilities**

No other treatment facilities are planned for the Coal Hollow Mine.

**Siltation Structures: Exemptions**

No exemptions are requested for the Coal Hollow Mine.

**Discharge Structures**

Each impoundment will be constructed with a spillway that will function as both the emergency and principle spillway. Each of these spillways will safely discharge a 25-year, 6-hour precipitation event. Impoundments 1 and 2 will be constructed with a drop-pipe spillway system. Impoundments 3 and 4 will be constructed with open channel spillways designed to discharge a 24-hour duration, 100-year storm event. They will be vegetated to minimize erosion. Drawing 5-28 through 5-32 provides the details for these structures.

**Impoundments**

The Applicant met the following requirements for the sedimentation ponds which are the only planned impoundments :

- The Applicant will not construct any impoundment meeting the MSHA size or other criteria of 30 CFR Sec. 77.216(a) (Section 743.110).
- The Applicant had the designs for the four impoundment certified by a registered professional engineer. See Drawing 5-28 through Drawing 5-32. The Applicant provides slope stability analysis for the four sediment ponds. See Appendix 5-1.
- The Applicant discusses the freeboard designs in Section 743.120 of the PAP.
- The Applicant described the preparation of the impoundments' foundations in Section 533.200 of the PAP.
- The Applicant discussed how the impoundments' slopes would be vegetated and riprapped to protect against erosion.
- The Applicant states in Section 514.300 that a professional engineer or specialist experienced in the construction of impoundments will inspect impoundments during



construction, upon completion of construction, and at least yearly until removal of the structure or release of the performance bond; and will provide the Division certified reports on the construction and maintenance. A copy of the reports will be retained at or near the mine site.

- The Applicant commits in Section 515.200 that any potential hazards identified by inspections will promptly be reported to DOGM, along with emergency procedures for public protection and remedial action.

The Applicant does not contemplate construction of any permanent water impoundments; coal processing waste banks and coal processing waste dams or embankments (521.125). The Applicant does not contemplate construction of any impoundments meeting the RCS Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CFR Sec. 77.216. 521.125.

Task 2910 deficiency: *"The Applicant must state how the impoundments will be protected from rapid drawdown. Rapid drawdown can occur in earth dams when rapid reductions in the water level produce dangerous changes in pore water pressure. This occurs because the water in the soil tends to flow back into the reservoir through the upstream face. In this scenario, even a period of some weeks may bring about a 'rapid' change in the pore water pressure distribution".*

The Applicant has submitted a revised Appendix 5-1, Slope Stability Analysis for Proposed Excess Spoil Structure and Sediment Pond Impoundments, prepared by Taylor Geo-Engineering, LLC. The rapid drawdown analysis was performed for ponds #1, #1B, 2, 3, and 4 and the report is contained on pages 6 and 7 of the slope stability analysis.

The rapid drawdown analysis was performed under the assumption that the spillways became plugged, and the basin impounds water to the top of the embankments. Then the water is released or pumped down to the bottom of the basins. The geo-tech analysis utilized soil strengths based on "total stress conditions" as determined from the tri-axial shear tests. The Taylor report #307001 states *"it should be noted that rapid drawdown is highly unlikely since spillway and outlet piping will be no more than four feet below the top of embankments"*. The safety factors reported in the rapid drawdown analysis are considered conservative and range from 1.2 to 1.9. Based on these, no additional protection for the embankments is felt to be necessary.

### **Ponds, Impoundments, Banks, Dams, and Embankments**

Chapter 5, p. 5-47 and Section 743 state that no impoundments meeting the NRCS Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CFR Section 77.216 (a) are planned for the Coal Hollow Mine.

The proposed mine plan anticipates the construction of five sediment control ponds, (ponds #1, 1B, 2, 3 and 4). Designs for these ponds are contained as Figures 12, 12B, 13, 14 and

15. A geotechnical analysis of the embankment stability for the proposed structures is contained in Appendix 5-1. The minimum static safety factor for impounding embankments is 1.3 for a normal pool with steady state seepage saturation conditions (R645-301-533.110). All of the proposed pond designs have static safety factors ranging from 2.2 to 5.3.

The certifications, drawings and cross sections can be viewed in Drawings 5-25 through 5-31 and Appendices 5-1 and 5-2. The 3-foot freeboard designed for the impoundments should be sufficient to prevent overtopping from waves and storm events.

### **Water Replacement**

Water replacement is discussed in Section 727. Long-term diminution of flow will be replaced with water from a well that has not been drilled yet. The town of Alton has entered into an agreement to transfer a point of diversion for water rights to 50 acre-feet of water, which the Applicant plans to use to satisfy the water replacement requirements: a copy of the agreement is in Appendix 7-8. The planned new water well will be constructed on lands currently leased by Alton Coal Development, LLC. It is not clear if this will be the water-supply for the mine or for water-replacement only. If the latter, the Applicant needs to commit to have the water-replacement well drilled and developed before beginning overburden removal for Pits 13, 14, and 15.

### **Findings:**

Hydrologic Information is not sufficient to meet the requirements of the Coal Mining Rules. Before the Division can approve this mine plan, the Applicant must provide the following, in accordance with:

**R645-301-731.300**, Appendix 6-2 shows unacceptable levels of selenium in the zone below the coal and in the vicinity of CH-06-05, below 35 ft. where either insufficient sample provides no information on selenium levels or high levels of selenium were recorded. To ensure that selenium levels are adequately represented by these six core holes and that selenium levels in the surface and in the submerged water table remain low, the Division will require a selenium monitoring plan for soils and overburden during final placement. Refer to Attachment 1 of the Division's 2008 Guidelines for Topsoil and Overburden Handling when writing the Coal Hollow selenium monitoring plan. • **and R645-301-121.200**, The Applicant states in Section 728.332 that Wyoming considers a value of 0.3 mg/kg selenium as suitable and between 0.3 and 0.8 mg/kg selenium as marginally suitable for topsoil and topsoil substitute. This statement is inaccurate and must be corrected. Refer to Acid/Toxic discussion above. [PB]

**R645-301-731.800**, Restated deficiency from Task 2910. The Applicant must provide reclamation designs for the eastern permit boundary where the mining pits meet

the undisturbed alluvium. Such designs will specify engineering methods to be used to minimize drainage from the alluvium into the fill in the reclaimed pits (as the pits are filled and reclaimed) thereby protecting the hydrologic balance in Sink Valley. In the cover letter for the December 2008 submittal, the Applicant states that this has been addressed, but the information could not be found in Chapters 5 or 7.[JDS] The Applicant should discuss how the pit will be reclaimed to restore the groundwater level in Sink Valley. [JS, DD]

**R634-301-731.530**, It is not clear if the water replacement well will also be the water-supply for the mine or for water-replacement only. If the latter, the Applicant needs to commit to have the water-replacement well drilled and developed before beginning overburden removal for Pits 13, 14, and 15. [JDS]

## **SUPPORT FACILITIES AND UTILITY INSTALLATIONS**

Regulatory Reference: 30 CFR Sec. 784.30, 817.180, 817.181; R645-301-526.

### **Analysis:**

The Applicant listed the support facilities in Section 526.220.

The Applicant has added minor facilities to Drawings 5-3, 5-4, 5-5,5-6,5-8A, 5-8B, 5-8C.

Drawing 5-3 Facilities and Structure Layout shows the plan view for the surface facilities which includes a shop, offices, coal stockpile area, coal reclaim and loading facilities, etc.

A 750 gallon septic vault is depicted on Drawing 5-6, in conjunction with the 150 foot by 108 foot office building.

Drawing 5-7 shows a 208 foot by 108 foot shop building. This building will house a 750 KVA generator. A 1200 KVA generator is shown on Drawing 5-8B between the coal stockpile and the truck dump hopper. All electrical power for the Mine facilities area is provided by the two diesel generators. Drawing 5-8B, Facilities and Structures / Electrical, shows how sub-surface electrical conduits will be run to provide power from the diesel generators to the various surface facilities. There are no high voltage electrical transmission lines shown on any of the PAP maps.

Drawing 5-8 and 5-8A shows an equipment wash bay with dimensions 50' X 60' X 50' height. The wash bay has a central floor drain which reports to a sump. How the sludge material and water from the sump will be handled must be described in the surface drainage plan.

---

OPERATION PLAN

---

Drawing 5-8 shows a 28,000 gallon fuel storage facility which contains two 12,000 diesel tanks and a 4000 gasoline storage tank. A 50,000 gallon oil storage containment is also shown.

The Applicant must develop and P.E. certify a spill prevention and counter measure plan for these bulk storage facilities (R645-301-731.121).

Many comments were received concerning dust control and the implications for visibility in the area. Task 2910 deficiency: **R645-301-526.222 and R645-301-423**, *"The Applicant must give a detailed description of the specific dust control structures that will be installed to ensure that fugitive dust is controlled"*.

Drawing 5-8C, **Facilities and Structures, Water Plan** shows an aerial view of the plan to provide water procurement and storage for application on the Coal Hollow mine haul roads. Section 526.220 under **Dust Control Structures** contains a description of the water systems. A solar powered ground water pump will supply volume to two 16,000 gallon portable, steel water tanks. The tank located in the facilities area will provide non-potable volume for the wash bay, and septic facilities at the office building. The tank located along the primary haul road to the mining area will provide volume for the water trucks controlling fugitive dust within the permit area.

**Findings:**

The Application does not meet the requirements of the Utah Coal Rules. In accordance with the requirements of :

**R645-301-731.121 and R645-301-751**, The Applicant must develop and P.E. certify a spill prevention and counter measure plan for the bulk storage facilities which are to be built as part of the Alton Coal Development Coal Hollow Mine surface facilities. The MRP must include information stating how the surface facilities will be operated in order to meet the performance standards of R645-301-750.

**SIGNS AND MARKERS**

Regulatory Reference: 30 CFR Sec. 817.11; R645-301-521.

**Analysis:**

The Applicant meet the requirements of this section. The Applicant's commitments to place signs and makers are listed in Section 521.200 through Section 521.270 of the PAP.

### **Findings:**

The information provided in the application is considered adequate to meet the requirements of this section.

## **USE OF EXPLOSIVES**

Regulatory Reference: 30 CFR Sec. 817.61, 817.62, 817.64, 817.66, 817.67, 817.68; R645-301-524.

### **Analysis:**

#### **General Requirements**

The Applicant does not anticipate the need for blasting. Section 523 states that blasting may be implemented after clearing vegetation. Section 524 suggests that a " cursory analysis" indicates blasting may not be necessary for this mining operation due to the soft clay and shale overburden and due to the mining of the coal from on top of the seam to avoid a wet clay layer below. However, submittal of a blasting plan has been provided in accordance with R645-301-524.

Section 627, p. 6-19, Overburden Thickness and Lithology, provides information relative to the types and thicknesses of overburden in the proposed mining area. An alluvial layer ranging from zero to fifty feet in thickness overlies a shale layer which varies from 2 to 200 feet in thickness.

The original mine plan did not include a blasting plan as the Applicant proposed to remove overburden using trucks and front end loaders. This method does not include a means to break overburden, which is the primary function of explosive usage.

The applicant submitted a generic blasting plan in Section 524, Blasting and Explosives, p. 5-22. The blasting plan is contained in Appendix 5-4. The Applicant has committed to providing the Division with a blast design prior to commencement of blasting conditions. The design will be based upon the geologic conditions encountered during the overburden and coal removal process.

#### **Preblasting Survey**

All reference to using five pounds of explosive has been removed from the PAP.

There are two dwellings within one-half mile of any part of the permit area. These are the Swapp and Pugh homes. The Applicant has committed to notifying these families at least 30 days in advance of any surface blasting how to request a pre-blast survey of their dwellings.

The Swapp and Pugh Ranches each contain several other out buildings. Only the homes have foundations, with frame construction. All out buildings are wood frame construction.

### **General Performance Standards**

The Applicant addressed the general performance standards in Section 524 of the PAP.

The Applicant has committed to conducting all surface blasting activities between sunrise and sunset, unless an unscheduled blast is needed (See Chapter 5, page 5-24, section 524.420).. If so, the unscheduled blast will be approved by the Division, based upon a showing by the Applicant that the interests of the public will be protected from noise and other possible adverse impacts.

The Applicant has committed to publishing and distributing a proposed blasting schedule at least 10 days but not more than thirty days prior to the initiation of blasting activities.

### **Blasting Signs, Warnings, And Access Control**

Section 524.500-532, Blasting and Warning Signs, Access Control, is discussed on page 5-25. The Applicant will place blasting signs reading "Blasting Area" within 100 feet of any public right-of-way. All Mine entrances will have signs with explosive usage warning signs, with identification of the various audible warning and all-clear signals. All persons living or working within one-half mile and all personnel working within the Mine permit area will be knowledgeable in the meaning of the audible signals.

Alton Coal Development will control access to blasting areas for the purpose of keeping livestock and un-authorized personnel out of the area until ACD determines that no unusual hazards have been created by the mining sequence.

### **Control of Adverse Effects**

Chapter 5, page 5-26, section 524.600-610, Adverse Effects of Blasting, contains the Applicants commitment to conduct blasting to control air blast, ground vibration and fly rock outside of the permit area. Mining will be conducted so as to prevent changes in the course, channels or availability of surface and ground water outside the Mine permit area.

The maximum legal weight of explosives per borehole when approaching within 1,000 feet of the Swapp ranch (Dames) dwelling must be calculated using a scaled distance factor of 50.

The maximum legal weight of explosives per borehole when approaching within 1,000 feet of the Sorensen ranch must be calculated using a scaled distance factor of 55.

### **Records of Blasting Operations**

Section 524.700 Records of Blasting Operations lists the requirements for properly documenting all surface blasts to be conducted by Alton Coal Development. The PAP contains the required commitment to maintain all blasting records for a minimum period of three years for Division or public inspection purposes.

### **Findings:**

The information provided in the application meets the requirements of this section.

## **MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS**

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

### **Analysis:**

Map 1-2, Project Area LBA shows the project area and the proposed expansion for the federal leases. Map 5-10, Coal Removal Sequence, shows the anticipated dates for when coal would be mined in the permit area.

Deficiency task 2910: **R645-301-521.141**, *"The Applicant must show on Map 5-10 or a similar map the anticipated **dates** for when the Applicant would mine coal from the expansion areas. The Division needs to know the dates when the applicant anticipates acquiring additional sub-areas because the preferred reclamation plan is based on additions to the permit area"*.

Drawing 5-2, Disturbance Sequence, shows the areas to be disturbed over four years of coal recovery. The final pit (Year 3) is the area in question relative to the reclamation plan for this site. In Year 3, topsoil removal, storage and overburden removal will expose the minable coal seam in the final pit area. It is not possible for the Applicant to anticipate dates for expansion, because the majority of the coal outside of the proposed permit boundary is federally owned and which must be acquired through the Lease By Application (LBA) and bidding process.

The Permittee has provided two options for the reclamation of the final pit area. The first option is to obtain leases outside the proposed permit boundary, and use spoil from the new leases to reclaim the final pit area of the proposed Coal Hollow permit boundary. This is the Applicant's preferred option and it is shown on Dwgs. 5-35 and 5-36. Drawing 5-38,

---

OPERATION PLAN

---

Reclamation Sequence, shows that the extreme south and north areas (processing/loading facilities) will be reclaimed in Year 4.

The Applicant has requested approval of a two year time frame between final pit coal recovery and reclamation, to facilitate implementation of the preferred reclamation scenario. If Alton Coal Development cannot obtain the federal leases within two years of coal recovery in the final pit, then they propose to proceed with the alternative reclamation scenario.

The Division can not allow a period of two years to pass between final coal recovery in the proposed permit area and initiation of reclamation (see deficiency written under R645-301-542.100 and R645-301-553, Backfilling and Grading in this Technical Analysis).

### **Mining Facilities Maps**

The Applicant did not meet the requirements of this section. The Applicant must label coal stockpile, conveyors and coal load out facilities on Drawing 5-3, R645-301-521.170.

### **Mine Workings Maps**

The Applicant met the requirements of this section. There are no mines in or near of the permit area.

### **Certification Requirements**

The Applicant met the requirements of this section. A registered professional engineer certified all appropriate maps.

### **Findings:**

The information provided is not adequate to meet the requirements of this section. Before approval, the Applicant must provide the following in accordance with:

**R645-301-521.141**, Restated from Task 2910, The Applicant must provide "*a detailed timetable for the completion of each major step in the reclamation plan*". This requirement is relative to the initiation of final pit reclamation activities. [PHH]



# RECLAMATION PLAN

## GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

### Analysis:

The reclamation plan described in Section 542 is contemporaneous with the operation plan described in Section 528. Overburden removal is shown on Dwg 5-16. Operational sequence and contemporaneous reclamation sequence is shown on Dwg 5-17 through 5-19. The reclamation sequence is shown on Dwg. 5-38. Mining pits will be reclaimed within 180 days of coal removal or 1,500 ft. of active coal face. An excess spoil pile will cover 87 acres at final reclamation and rise 100 ft above the original contour. All reclaimed slopes will be 3h:1v. The surface four feet of all reclaimed surfaces will be replaced topsoil and subsoil. The post mining land use is grazing land or pastureland.

The reclamation techniques and protection measures are described in Chapter 3, Sections 340 through 358.530, pages 44 through 74.

### Findings:

Specific findings for reclamation are addressed by discipline below.

## POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

### Analysis:

The post mining land use for the areas to be mined is described in Volume 2, Chapter 4, and Pages 4-6 through 4-9. Assuming the Applicant implements the reclamation plan as described in the MRP the post mining land use should be achieved. There are two landowners of the permit area, Richard Dame and Burton Pugh. The Applicant and DOGM staff have consulted with them regarding their interests in the final outcome of the reclamation efforts. Management plans for each landowner are described on Pages 4-7 and 4-8 of Chapter 4.

---

RECLAMATION PLAN

---

*The Management Plan for the Richard Dame Property*, the current land use of Mr. Dame's property is forage for domestic livestock and some wildlife species. The land includes irrigated pasture for cattle and some horses, native stands of pinyon juniper and sage brush communities as noted on map 3-1, Vegetation. Mr. Dame has expressed an interest to return his property to pasture land that focuses on domestic livestock and includes some plant species for wildlife habitat. Table 3-19 includes the seed mix, native and introduced grasses and forbs, to be planted to meet the landowner's request. A copy of the signed management plan is included in appendices 4-3 and 4-4.

*The Management Plan for the Burton Pugh Property*, the land owned by Mr. Pugh in the permit area provides forage for livestock and some wildlife species as well. The land includes non irrigated pasture land, meadows, sagebrush/grass, pinyon juniper and oak brush communities as noted on map 3-1. The livestock on the property are mostly cattle and sometimes horses. Mr. Pugh has expressed an interest in restoring his land to its original use or better condition for livestock and wildlife habitat. In order to accomplish this pasture lands will be reclaimed with the focus on domestic livestock. The seed mix will include plant species used by wildlife species in addition to native and introduced grasses. A portion of the property will be reclaimed to sage -grouse habitat as well as mined areas that were interspersed with pinyon juniper. A copy of the signed management plan is included in appendices 4-3 and 4-4.

Appendix 1-7 includes an Amended Grant of Easement and Assignment Agreement for County Road K3900 between Sink Valley Ranch, LLC and Alton Coal Resources, LLC. This document was signed on November 26, 2008 and filed with the County Recorder on December 4, 2008. This document confirms that the landowner is aware of two restoration alignment options on his land and has given the County a 66 ft wide easement under either scenario.

**Findings:**

The information in the application meets the requirements of this section of the regulations.

**PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES**

Regulatory Reference: 30 CFR Sec. 817.97; R645-301-333, -301-342, -301-358.

**Analysis:**

The application includes measures to be taken to protect fish wildlife and related environmental values during reclamation operations in chapter 3, Sections 358 through 358.530, pages 72 through 74 including:

- Threatened and Endangered Species,
- Eagles,
- Removal of a Threatened & Endangered Species,
- Riparian and Wetland Areas,
- Powerline and Transmission Facilities,
- Fences and Conveyers and,
- Toxic-Forming Areas.

Chapter 5, Section 521.125, page 5-8 states that "The MRP does not contemplate construction of any permanent water impoundments; coal processing waste banks and coal processing waste dams or embankments. **Chapter 3, p. 3-80** indicates that there will be no ponds that contain hazardous concentrations of toxic forming materials.

**Findings:**

The information in the application meets the requirements of this section of the regulations.

## **APPROXIMATE ORIGINAL CONTOUR RESTORATION**

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

**Analysis:**

The Applicant states that due to the swell factor excess spoil would be generated and mentions a request for a variance from the approximate original contour requirements in various sections of the PAP including, Section 512.260, Section 553.200, and Section 553.120.

Task #2910 deficiency was written to obtain information about the request for variance, as follows: **R645-301-553.110 and R645-301-553.800**, *"The request for variance from Approximate Original Contour must describe whether the restoration of original drainage patterns can be achieved (R645-301-762.100) or whether the criteria of R645-301-553.800 apply to this surface mine. Excess spoil should be graded to attain the lowest practical grade (R645-301-553.800) and provide a natural appearance to the contours of the spoil pile which would include irregular slopes and irregular surface such that the reclaimed site is compatible with the natural surroundings (R645-301-412.300).*

Alton Coal Development, LLC has responded that the criteria of R645-301-553.800, Backfilling and Grading; Thick Overburden applies to the Coal Hollow surface mine.

---

RECLAMATION PLAN

---

The Alternate Reclamation Scenario (adjacent Federal coal leases not obtained) describes an estimated 1.8 million cubic yards of excess spoil to be generated during the three year life of mine (Section 553, p. 5-65).

The spoil pile covering approximately 85 acres of the disturbed area (435 acres total ) will be reclaimed to the requirements of the approved variance from approximate original contour. Section 553.110 explains that *"In areas where excess spoil and variance from approximate original contour occur, the slopes will be re-graded to a maximum angle of 3h:1v and most slopes are flatter (than) as shown on Drawings 5-35 and 5-36."* Appendix 5-1 contains a geo-technical analysis which indicates that the spoil material fills will be stable and meet the minimum long term static safety factor of 1.5. The Applicant has re-designed the proposed excess spoil fills and fill above the approximate original contour to provide a natural appearance. Concave fill slopes will be implemented to minimize erosion. The revised design is shown on Drawings 5-35 and 5-36. The original drainage pattern of Lower Robinson Creek will be restored to a meandering channel.

The mining and reclamation plan will achieve the following backfilling and grading requirements for the excess spoil pile:

- Minimize off-site effects.
- Achieve a final surface configuration that closely resembles the general surface configuration of the land prior to mining. The main concerns are slope length and grade, and whether the drainage patterns tie into the surrounding drainages.
- Provide a subsurface foundation for a vegetative cover capable of stabilizing the surface from erosion.
- Support the approved postmining land use.

**Findings:**

The information provided in the permit application meets the requirements of this section.

## **BACKFILLING AND GRADING**

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

**Analysis:**

**General**

The Applicant has met the following general backfilling requirements:

- Achieve the approximate original contour. The Division considers that the erosion and water pollution will be minimized and that the site will be compatible with the postmining land use if the hydrology, vegetation and land use requirements have been met.
- Eliminate all highwalls: The Applicant states in Section 553.120 of the PAP, that all highwalls will be eliminated. Drawing 5-35, Post Mining Topography – Preferred Scenario and Drawing 3-37, Post Mining Topography – Alternative Scenario, both show that all highwalls will be eliminated at final reclamation.
- Eliminate all spoil piles: The Applicant has requested a variance from AOC under R645-301-553.800 for thick overburden. The Applicant stated in Section 553.120, Section 553.200 and Section 553.210 of the PAP that all spoil will be properly handled. Drawing 5-35, Post Mining Topography – Preferred Scenario and Drawing 3-37, Post Mining Topography – Alternative Scenario, both show a reclaimed spoil pile.
- Eliminate all depressions: The Applicant states in Section 542-100 through 600 that all depressions would be removed except small depression used to retain moisture, minimize erosion, create and enhance wildlife habitat or assist vegetation.
- Achieve a postmining slope that does not exceed either the angle of repose of such lesser slope as is necessary to achieve a minimum long term static safety factor of 1.3 and to prevent slides; minimize erosion and water pollution both on and off the site; and, support the approved postmining land use. In Section 553.130 of the PAP, the Applicant states that the postmining slopes will not exceed the angle of repose and that the slopes will have a long term static safety factor of at least 1.3. Appendix 5-5 provides a stability analysis for the reclaimed areas.

The Applicant has requested a variance from the requirements of R645-301-553 relative to the 60 day limit or 1500 linear feet of distance from the coal recovery area to the backfill area for Pits 24 through 30. With this variance, the Applicant states that impacts to the reclaimed areas on the west edge of the currently proposed permit boundary will be minimized, as excess spoil generated from Pits 24 – 30 can be used to backfill pits created from extraction of coal on Federal lands.

The Permittee has provided two options for the reclamation of the final pit area. The first option is to obtain leases outside the proposed permit boundary, and use spoil from the new leases to reclaim the final pit area of the proposed Coal Hollow permit boundary. This is the Applicant's preferred option and it is shown on Dwgs. 5-35 and 5-36. Drawing 5-38, Reclamation Sequence shows that the extreme south and north areas (processing/loading facilities) will be reclaimed in Year 4.

In order to receive additional time to achieve rough backfilling and grading in Pits 24 through 30, ACD must demonstrate through a detailed analysis that additional time is necessary, in accordance with the requirements of R645-301-553 and R645-301-542.200. ACD's request for an exemption from the requirements of R645-301-553 for Pits 24 through 30 is based upon the following conclusions by the Applicant:

- 1) A spoil versus pit backfill deficiency exists as a result of the high stripping ratios encountered in Pits 10 through 15.
- 2) The fill above original contour is constructed because overburden from pits that are 150 feet + (Pits 10-15) does not fit into pits that are 70 feet deep or less.
- 3) It takes overburden from several pits that are 80 feet in depth (Pits 16 – 30) to fill one pit that is more than 150 feet in depth.
- 4) Granting an exemption from the requirements of R645-301-553 would eliminate the need for temporary spoil stockpiles keeping contemporaneous reclamation in process.

These conclusions seem reasonable to allow a possible exemption from the requirements of R645-301-553 for Pits 24 through 30. However, final approval for an exemption from the requirements of R645-301-553 will be based upon how the Applicant meets the requirements of R645-301-553 for Pits 2-8, Pits 9-15 and Pits 16-21 relative to timely reclamation. The Division will require that the Applicant provide the Division with updates on the progress made towards procurement of any adjacent Federal coal leases, see deficiency below.

If the Permittee can not obtain additional coal leases in Sections 29 and / or 30, the Permittee must commit to reclaiming the most southern section of the coal recovery area, so that re-location of the Kane County Road #136 (K3900) can be initiated as soon as possible. The Applicant would like the Division to grant a two year time frame between final pit coal recovery and implementation of the alternative reclamation scenario. [If ACD cannot obtain the new leases, the proposed plan is to allow ACD to proceed with the alternative reclamation scenario (within two years from the time that coal recovery ceases.) However, The Division can not allow a period of two years to pass between final coal recovery in the proposed permit area and reclamation of Pits 24-30. A limited amount of time might be approved by the Division at the completion of coal extraction activities from the final pit, prior to initiation of reclamation activities, pending the disposition of the federal lands at that time.

With regard to Task 2910 deficiency: **R645-301-553.130**, *"The Applicant must show that all reclaimed slopes (including those not associated with the excess spoil area) have a safety factor of 1.3 or greater and that the slope angles are less than the angle of repose. The Applicant includes safety factor calculations for the excess spoil areas but did not mention the safety factors in other areas. One way to address the issue is to identify the slopes that would have the lowest safety factors (longest slope and steepest slope) and show that they meet the minimum safety factor requirements. In addition, the Applicant must also state why the reclaimed slope angles are less than the angle of repose."*

Appendix 5-5, Stability Evaluation / Analysis for Reclaimed Slopes provides a slope analysis prepared by the mining and geotechnical engineering firm Seegmiller International, under the direction of Dr. Ben L. Seegmiller, a Utah registered professional engineer. Reclaimed slopes will be constructed of the same Tropic Shale material as the excess spoil pile, but the spoil backfill will not be compacted. The proposed design will backfill and grade the reclamation

slopes to a 3H:1V slope (vertical angle of 18.4 degree). The highest slope is anticipated to have a 20 foot vertical height. Material characteristics of the Tropic Shales are described on page 2 of the report. Tropic Shale materials "may have friction angles on the order of 24 degrees and cohesions of about 245 PSF".

Seegmiller International visited the Coal Hollow project area on August 8, 2008 to observe and measure angles of repose in the Mine area. The measured angles were reported to be approximately 33 to 35 degrees. The reclaimed slopes will thus be reclaimed to a vertical angle of 18.4 degrees, which is approximately one-half of the angle of repose of undisturbed native materials (33-35 degrees). The reclaimed slopes are noted as being generally dry, but some ground water could affect material characteristics within the slopes.

The Methodology of Slope Analysis is stated on p. 2 of Appendix 5-5 as follows:

*"The stability analysis method that will be employed is based on limiting equilibrium concepts. At limiting equilibrium, the forces tending to create stability are exactly in balance with the forces tending to cause slope failure and, therefore, a safety factor of 1.00 exists. Greater or lesser safety factors allow the relative degree of safety of a slope to be measured."*

Rotational failures were calculated via MCSLOPE, which was developed from PCSTABL5. "MCSLOPE...calculates a deterministic safety factor (SFd) and uses a Monte Carlo technique to estimate the probabilistic factor of safety (SFp) and a probability of slope failure (P/F)."

The following safety factors were determined by the Seegmiller analysis:

- 1) Dry Slope.....SF of 2.883 @ 20 foot high slopes at 3H:1V gradient.
- 2) Saturated Slope.....SF of 1.722 @ 20 foot high slopes at 3H:1V gradient.

The proposed fill slope design will be constructed to a 3H:1V gradient (or 18.4 vertical degrees). This vertical angle is approximately one-half of the general area angle of repose which has been determined at 33 to 35 degrees minimum. The planned slope angle is 14 degrees less than the angle of repose of the undisturbed areas.

With regard to Task 2910 deficiency **R645-301-553 and 542.200**: *"The Applicant will describe how and where the overburden will be placed for the initial box cut. • The Applicant must have a specific timetable for completing rough backfilling and grading in the PAP. • The Applicant must provide surveys of coal recovery at the end of each calendar month and show coal recovery on a plan view of the mining area at the end of each calendar month. • The Applicant must provide detailed descriptions of how overburden will be placed and provide documentation of placed backfill volumes, on a monthly basis. • The Applicant must provided*

rough backfill volumes taken from the survey of contemporaneous cross sections showing toe of backfilled slope on latitudinal and longitudinal basis in relationship to the coal seam being mined. • The Applicant must establish and follow a ground control plan for the safe control of all highwalls, pits and spoil banks, as approved by MSHA under 30 CRF77.1000 and the MSHA approved plan will be included as part of the mining and reclamation plan."

### **Initial Box Cut.**

Placement of backfill for the initial box cut is discussed in Section 553, p. 5-63. Overburden from Pits 1 - 8 will be removed and stored, then used for the reclamation of those pits. Drawing 5-15 shows three phases of coal recovery. Phase 1 involves mining of Pits 1-8 which have a low stripping ratio (approximately 5 cubic yards of burden : 1 ton coal). Spoil from the first three pits, including Pit 2 (the boxcut) will be placed in an excess spoil area located immediately west of Pit 1 (p. 5-63). When the excess spoil pile reaches 2.7 million loose cubic yards, the overburden from Pits 4- 8 will be used as backfill.

Phase 2 involves the mining of Pits 9-15. The overburden isopach of this area shows that the overburden and stripping ratio significantly increases (Dwg. 5-15). Quoting from the application:

*"This increase and the shape of the mining boundary for the Permit Area require a fill above approximate original contour that is an extension of the excess spoil pile. Material from Pits 9-15 significantly exceeds the backfill capacity available from Pits 1-8. The fill above approximate original contour blends in with the excess spoil structure from Phase 1 and extends an additional 2,500 feet to the east."*

A review of Drawing 5-13, Strip Ratio Isopach, indicates that the stripping ratio in the Phase 2 coal recovery area can vary from 5.5 : 1 in the SW corner of the recovery area to as high as 11 : 1 in the NE corner of Pit 15. The Preferred Reclamation Scenario Table (assuming procurement of adjacent federal coal leases) indicates that the Phase 2 coal recovery will generate 5,842,000 excess loose cubic yards of spoil material, with a total of 8,583,000 excess loose cubic yards of spoil for Phases 1 and 2, at 22 % swell factor (p. 5-64).

Phase 3 covers the overburden and coal removal from pits 16 through 30. Stripping ratios vary from 4:1 in the SW corner (Pits 24 -30) to 7:1 in the eastern end of Pit 16. If federal leases are obtained (outside of the currently proposed permit area), overburden from those new mining areas will be used to backfill the pits in Phase 3. This preferred scenario is so named because the Applicant feels the following will occur:

- 1) The preferred scenario for backfilling will minimize overall disturbance.
- 2) Resource recovery will be maximized by providing a transition into the federal reserves with minimal effect to the existing reclamation in the currently proposed permit area.



- 3) Variances from AOC over the Federal reserves will eliminate the need for an excess spoil storage area for a new box cut on the Federal reserves.
- 4) The preferred reclamation scenario provides a method for implementing concurring reclamation by eliminating temporary spoil stockpiles.

### **Specific Timetable.**

A timeframe for completing rough backfilling and grading is provided on p. 5-65 which states the following: "In both scenarios (Preferred and Alternate), rough backfilling and grading operations will follow coal removal by not more than 60 days or 1500 linear feet." Text on Page 5-66 states that "mined areas will be backfilled and graded within 180 days following coal removal, or 1500 feet of the active coal removal face. It appears that the information in the two aforementioned paragraphs conflicts. However, they may not conflict if the Applicant means to say that the backfilling and grading completed in 60 days of coal removal and ready for topsoiling and seeding within 180 days following coal removal. The statement on p. 5-66 should be more clearly written in the Application.

The Applicant has described the backfilling and grading processes to be implemented during the three phases of coal removal in Chapter 5, pages 5-65 and 5-66. The closing statement of Section 553, Chapter 5, page 5-66, states the following; "*As currently planned, the initial mining areas will be backfilled to the planned post mining contour, graded and the topsoil replaced in late Year 1*". A review of Drawing 5-10, Coal Removal Sequence indicates that the Applicant, Alton Coal Development, intends to extract coal from Pits 1-12 during Year 1. As stated above, "the current plan is to initiate backfilling of the initial mining areas....in late Year 1". This current plan does not meet the requirements of R645-301-553, which requires that backfilling and grading must be initiated no more than 60 days after coal recovery is completed, or a maximum of 1500 linear feet from the recovery area.

The current plan shows recovery of coal from Pits 2 through 8 covering a north / south distance of 2200 feet, as well as an additional 750 feet on an east / west direction from Pits 9 – 12 (all coal recovery during Year 1). This plan is double the length allowed in R645-301-553. This plan is deficient; in accordance with the requirements of R645-301-553, Backfilling and Grading, the Applicant must revise the current plan for backfilling, grading, topsoiling and revegetating stated on Page 5-66 such that it meets the requirements of R645-301-553. The Division requires that Pit 4 rough backfilling and grading be completed before burden removal is initiated in Pit 9. Pits 1, 5, 6 and 7 must be completed (rough backfilling and grading before mining in Pit 13 is initiated.

### **Coal Recovery Reporting.**

Alton Coal Development, LLC has made the following commitment, which is contained in Chapter 5, page 5-73: "Alton Coal Development, LLC will provide the Division, as part of the annual report for each calendar year, a plan view outline of the coal recovery, a 5 foot interval contour map of backfill progress and a reclamation progress map". This commitment is not adequate. It does not provide the Division with information on a frequency which is sufficient to ensure that the Applicant is meeting the requirements of R645-301-553, completion of rough backfilling and grading within 60 days or 1500 linear feet. Therefore, in accordance with the requirements of R645-301-542.100; Detailed Timetable of Each Major Reclamation Step, ACD will provide progress reports detailing when the rough backfilling and grading of Pits 2 and 3 will be initiated, and continue submitting those progress reports addressing rough backfilling and grading for the Phases 1, 2, and 3 coal recovery areas.

#### **Monthly Backfill Volumes.**

The Division is willing to accept a reporting frequency of every 60 days for placement and backfill of spoil where coal has been recovered. This reporting is necessary to ensure that coal recovery does not get too far ahead of rough backfilling and grading for any of the Phased coal recovery areas. The rough backfilling and grading of Pit 2 should be initiated before coal recovery has been completed in Pit 6 (approximately 1500 feet from northern edge of Pit 2). Once rough backfilling and grading in Pit 2 has been initiated, Alton Coal Development will continue to report to the Division, every 60 days, the following;

1. Coal recovery as it exists on a plan view map of the numbered pits;
2. The areas (coal recovery pits) where rough backfilling and grading has been completed;
3. The areas where coal recovery has been completed and contemporaneous rough back filling and grading is occurring.
4. The areas where grading has been completed, and topsoil is being placed.
5. The areas where seeding using the Division approved reclamation seed mix has occurred.

---

#### **MSHA Approved Ground Control Plan.**

Alton Coal Development, LLC has committed to obtaining an MSHA approved ground control plan for all highwalls, pits, and spoil banks prior to initiation of surface coal mining operations.

Three of the five items bulleted under task 2910 deficiency R645-301-553 and 542.200 are restated as separate deficiencies below under R645-301-553, R645-301-542.100, and R645-301-542.100 and R645-301-121.200.

#### **Previously Mined Areas**

There are no previously mined areas within the permit boundaries.

### **Backfilling and Grading On Steep Slopes**

There are not steep slopes within the permit area.

### **Special Provisions for Steep Slope Mining**

There are no special provisions for steep slope mining.

### **Findings:**

The Division can not support the variance from the 60 day/1,500 feet requirement for backfilling and grading based upon the supposition of acquiring the adjacent federal leases (which have not yet been made available). The Division does not have the authority to grant excessive time lapses between final coal recovery in an approved permit area and initiation of reclamation activities. It is the Applicant's responsibility to obtain additional coal leases outside the approved DOGM permit boundary prior to completion of coal recovery within the approved permit area. The Division can not allow a mined out area to sit idle for two years prior to implementation of the approved reclamation plan. The Division also has a responsibility to the citizens of Kane County, in that the re-construction of the County road should be completed in a timely fashion.

Three of the five items bulleted under task 2910 deficiency R645-301-553 and 542.200 are restated as separate deficiencies below under R645-301-553, R645-301-542.100, and R645-301-542.100 and R645-301-121.200. The information provided in the permit application does not meet the requirement of this section. Prior to approval, the Applicant must provide the following in accordance with:

**R645-301-542.100 and R645-301-121.200,** A timeframe for completing rough backfilling and grading is provided on p. 5-65 which states the following: "In both scenarios (Preferred and Alternate), rough backfilling and grading operations will follow coal removal by not more than 60 days or 1500 linear feet." Text on Page 5-66 states that "mined areas will be backfilled and graded within 180 days following coal removal, or 1500 feet of the active coal removal face." It appears that the information in the two aforementioned paragraphs conflicts. However, they may not conflict if the Applicant means to say that the backfilling and grading will be completed in 60 days of coal removal and ready for topsoiling and seeding within 180 days following coal removal. If the Division's interpretation of these two statements is accurate, please make the necessary corrections to the statement on p. 5-66. [PH]

**R645-301-542.100; Detailed Timetable of Each Major Reclamation Step, The**

Applicant will provide a timetable detailing when the rough backfilling and grading of Pits 2 and 3 will be initiated. This reclamation step will be initiated before coal recovery has been completed in Pit 6 (approximately 1500 feet from northern edge of Pit 2). •The application will describe how the Applicant will provide progress reports detailing when the rough backfilling and grading of Pits 2 and 3 will be initiated, and the continued submittal of those progress reports addressing rough backfilling and grading for the Phases 1, 2, and 3 coal recovery areas. The application will indicate reporting every 60 days, the following five items:

1. Coal recovery as it exists on a plan view map of the numbered pits.
2. The areas (coal recovery pits) where rough backfilling and grading has been completed.
3. The areas where coal recovery has been completed and contemporaneous rough backfilling and grading is occurring.
4. The areas where grading has been completed, and topsoil is being placed.
5. The areas where seeding using the Division approved reclamation seed mix has occurred. [PH]

**R645-301-553, Backfilling and Grading,** The Division can not support the variance from the 60 day/1,500 feet requirement for backfilling and grading based upon the supposition of acquiring the adjacent federal leases (which have not yet been made available). The variance request should be removed from the plan. The Division recommends that ACD apply for this variance ninety days before completion of coal recovery in Pit 24 and should include timely information relative to the procurement of any adjacent Federal coal leases. • The current plan shows recovery of coal from Pits 2 through 8 covering a north / south distance of 2200 feet, as well as an additional 750 feet on an east / west direction from Pits 9 – 12 (all coal recovery during Year 1). This plan is double the length allowed in R645-301-553. This plan is deficient. In accordance with the requirements of R645-301-553, Backfilling and Grading, the Applicant must revise the current plan for backfilling, grading, topsoiling and revegetating stated on Page 5-66 such that it meets the requirements of R645-301-553. The Division requires that Pit 4 rough backfilling and grading be completed before overburden removal is initiated in Pit 9. Pits 1, 5, 6 and 7 must be completed (rough backfilling and grading) before mining in Pit 13 is initiated.

## MINE OPENINGS

### Analysis:

Commitments in Sections 513.500, 529, 541, 542.700, 551, 731, 738, 748, 755 and 765 meet the requirements of the Coal Mining Rules for Mine Openings, including exploration bore holes, water wells, and monitoring wells.

- Wells constructed for monitoring ground water conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of ground- and surface-water resources and to protect the hydrologic balance.
- All wells will be managed to comply with R645-301-748 and R645-301-765. Water monitoring wells will be managed on a temporary basis according to R645-301-738.
- If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731.
- Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.
- A diagram depicting typical monitoring well construction methods is shown in Figure 7-11. A steel surface protector, with a locking cover, will be installed at monitoring wells to prevent access by unauthorized personnel. Where there is potential for damage to monitoring wells, they will be protected through the use of barricades, fences, or other protective devices. These protective devices will be periodically inspected and maintained in good operating conditions. Monitoring wells will be locked in a closed position between uses.
- When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.
- Any water well exposed by coal mining and reclamation operations will be permanently closed unless otherwise managed in a manner approved by the Division.
- Wells constructed for monitoring ground-water conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of ground water and surface-water resources and to protect the hydrologic balance. A diagram depicting typical monitoring well construction methods is shown in Figure 7-11.

Sections 513.500, 529, 541.100-400, 542.700, 551, 731, 738, 748, 755, and 765 outline the procedure that will be used for abandonment and closure of wells, including exploration holes and boreholes used for water wells or monitoring wells.

**Findings:**

Information on Mine Openings meets the requirements of the Coal Mining Rules.

**TOPSOIL AND SUBSOIL**

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

**Analysis:****Redistribution**

The Applicant has made several commitments to test topsoil and subsoil materials during removal to ensure that the reclaimed surface provides a suitable rooting medium to a depth of four feet (Section 232.500, App. 2-1 Section 5, pg. 5-3; Section 232.700).

The Applicant has stated that 90% of the subsoil used to construct the four foot cover depth will be of good to fair quality with respect to pH and lime characteristics. The applicant further states, "No subsoil or overburden with unacceptable characteristics will be placed within 48 inches of the reclamation surface" (Sec. 5 pg. 5-2 App. 2-1). It is understood that the unacceptable characteristics are defined in the DOGM Guidelines for Topsoil and Overburden Handling, as reproduced in Table 4-1, Sec. 4, App. 2-1.

Reclamation slopes will not exceed 3h:1v (Sec. 242.130(c)). Prior to topsoil placement, slopes will be smoothed (Sec. 242.110) and treated if necessary to reduce slippage of redistributed topsoil and subsoil (Sec. 242.200). Rubber tired equipment will be minimized on regarded slopes (Sec. 242.120). Dozers and scrapers will be used to replace the topsoil and subsoil to a depth of four feet that will be comprised of 6 – 12 inches of topsoil and the remainder subsoil (Sec. 5 App. 2-1 and Sec. 240). Soil replacement thickness will be checked using a GPS system (Sec. 242.110).

After soil placement, soils will be sampled for fertility and salinity with 1 sample taken per four acres (Sec. 243). Areas of compaction due to heavy equipment will be ripped, disked, and harrowed prior to seeding. Areas that are not compacted will be roughened slightly with dozer tracks prior to seeding. Soil amendments will be applied over the seed bed surface. All seed will be applied by drill seeder. Seeding will occur immediately after disking, harrowing or dozer tracking and mainly in the spring or fall. (Sec. 242.120 (b)). Either 1 T/acre straw or  $\frac{3}{4}$  to 1 T/acre wood fiber mulch will be applied to all reclaimed areas after seeding, as described in Section 244.200.

**Findings:**

The information provided in the application meets the requirements of the R645 Coal Rules for Soils Redistribution Plan.

## **ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES**

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

### **Analysis:**

#### **Reclamation**

Section 542 lists all roads which will be reclaimed as part of the approved post-mining land use.

The primary haul roads constructed during operations will be reclaimed. Section 542, p. 5-59 contains a narrative of the reclamation procedure for roads which will not be retained as part of the post-mining land use. In Section 542-100 through 600, the Applicant committed to reclaim all roads according to the requirements of R645-301-542.600.

#### **Retention**

Page 5-59 lists three roads to be retained: the County Road 136, the Lower Robinson Creek Road on Pugh property, and the road south to the water well (which will also provide access to the Swapp Ranch). The three roads are shown on Dwg. 5-35 and 5-37. Neither drawing shows the restoration of the Swapp Ranch access road. The Application should provide for restoration of the existing road access to the Swapp Ranch (owned by Dame), unless an agreement has been reached for Dame to access his property via the Pugh road and the Water Well Road. If so, please provide those agreements in Chapter 1.

Drawings 5-22C illustrates the reclaimed road across Pugh property to the boundary with the USFS. This road approximates the original alignment of K3993. The Applicant must verify this re-alignment with the County.

Drawing 5-22D illustrates the construction of a new road to the water well which will remain post-mining.

There is no design drawing shown for the access road to the Swapp Ranch (illustrated on Dwg. 5-35 and 5-37) because it will have the same specifications as the water well road design Dwg 5-22 D.

Drawing 5-35 shows a revised CR 136 alignment around the spoil pile (plan view) on fill above approximate original contour as the Preferred Reclamation scenario. Drawing 5-37 shows the alternate reclamation scenario, with a straight alignment through the reclaim pit area, also on fill, but at the approximate original elevation.

Drawing 5-22E shows a plan view, gradient profile, and cross-section of the re-alignment of County Road 136 (K3900) around the reclaimed spoil pile area (the preferred scenario). The private landowner (C. Burton Pugh) has given Kane County a Grant of Easement (See Appendix 1-7) for this re-alignment. Dwg. 5-22E ties into the plan view and gradient profile of Dwg 5-22F at cross-section 60 + 51.82 feet.

Drawing 5-22F, shows a plan view, gradient profile, and cross-section of the most southern section of County Road 136 (K3900). from cross-sections 61+00 to 92+00, ending at 92 + 85.55 feet. The "typical roadway section(s)" on both 5-22E and 5-22F are identical.

Drawing F-22G is a repetitive drawing which shows the same road cross section and construction specifications as 5-22E and 5-22F.

There is no drawing provided for Option A described in the Amended Grant of Easement and Assignment Amendment for County Road K3900 found in Appendix 1-7.

All road designs are P.E. certified by Mr. Chris McCourt, Utah registered professional.

County Road #136 will be re-constructed within the permit area by the Kane County Road Department. *"The re-construction will occur concurrently with the final stage of reclamation as scheduled on Drawing 5-38 and is expected to be completed by the end of Year 4,"* (Chapter 5, page 5-59). The Applicant has provided details for the reconstruction of County Road 136 on Drawing #'s 5-35, 5-37, 5-22E, and 5-22F. However, as can be determined from analysis of Drawings 5-36, and 5-37A, County Road # 136 is to be constructed on top of backfilled Tropic Shale material in varying from 80 feet to 100+ feet in thickness.

The Applicant must either develop a mine plan which provides for leaving the coal beneath the Kane County road right-of-way or provide a geotechnic analysis (in accordance with R645-301-527.250) of the subgrade fill of the to be re-constructed Kane County road #136 right-of-way which confirms that construction specifications can be met. The soils analysis must include testing of weathered Tropic Shale materials.

According to Section 627, p. 6-19, Overburden Thickness and Lithology, *"The lower portion of the Tropic Shale overlies the coal seam which is being proposed for mining in thicknesses up to 200 feet. The Tropic shale consists predominantly of soft shales, silty shales and claystones, with occasional thin layers of siltstone and bentonite-like clay layers up to about two feet in thickness."*



Shales exposed to the atmosphere, absorb moisture then disintegrate and crumble. This process is called slaking. This is common in shales associated with coal seams, and the Division needs an analysis discussing whether these materials can meet class "B" subgrade requirements, especially in thicknesses up to 100 + feet.

If the Applicant provides adequate engineering support confirming that the backfilled spoil areas within the County road #136 right-of-way can meet Kane County road department specification for sub-grade, the Applicant must provide text in the PAP which clearly states that ACD will effectively reclaim the sub-grade area within the Kane County Road #136 right-of-way. The Applicant must meet all R645 backfilling and grading requirements up to the point that the Kane County Road Department takes over jurisdiction for the re-construction of the road in its original alignment.

**Findings:**

The information provided in the permit application does not meet the requirement of this section. Before approval, the Applicant must provide the following in accordance with:

**R645-301-542.600**, Maps and narrative in the application must describe reconstruction of County Road 136 to its original alignment as requested by the County. The application must provide a drawing and specifications for Option A described in the Amended Grant of Easement and Assignment Amendment for County Road K3900 found in Appendix 1-7. •Drawing 5-22C illustrates the reclaimed road across Pugh property to the boundary with the USFS. This approximates the alignment of K3993 which was temporarily closed during mining. The Applicant must document this re-alignment and re-construction of K3993 with the County.  
[PHH]

**R645-301-527.250 and R645-301-534.200, R645-301-512.250**, Design and Reconstruction of Roads, The Applicant must provide a geotechnical analysis of the spoil materials associated with the Tropic Shale and alluvium for use as sub-grade material as part of the re-construction design of all post mining roads within the coal recovery area. A Utah professionally certified civil engineer specializing in highway construction must perform the analysis for the two roads to be reconstructed on fill:

- 1) The Class "B" Kane County road #136 which must be capable of handling the heaviest vehicle weights.
- 2) The Swapp Ranch access road (shown in both reclamation scenario drawings, Dwg 5-35 and Dwg. 5-37 and having the same specifications as the Water Well Road (Dwg. 5-22 D).

The application must include the results of the geotechnical analysis and any resulting design standards for road construction required to make the sub-grade

materials stable. If the Applicant cannot provide adequate geotechnical confirmation or achieve the design standards to ensure that all post-mining roads to be reconstructed on spoil will be stable, then the Applicant must consider other options. [PH]

**R645-301.514.120**, The application must state that copies of the spoil placement engineering inspection reports for the County road right-of-way and the Swapp Road will be provided to the Division. These inspection reports must document the Proctor compaction and other design requirements to be achieved for the reconstructed roads. The Division can then coordinate with Kane County and the Applicant regarding sub-grade adequacy for reconstruction of the County Road #136 and the Swapp Road in the mined out area. [PH]

## HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

### Analysis:

#### Hydrologic Reclamation Plan

The hydrologic monitoring plan is described in Section 731.200 of Chapter 7 (and also Section 12.0 of Appendix 7-1). Hydrologic monitoring protocols, sampling frequencies, and sampling sites are described in Table 7-4. Groundwater and surface-water monitoring locations are listed in Table 7-5. Operational field and laboratory hydrologic monitoring parameters for surface water are listed in Table 7-6, and for groundwater in Table 7-7 of Chapter 7. Hydrologic monitoring during reclamation is assumed to be the same as during mine operation, but this needs to be clarified.

The Applicant commits in Section 763.100 that siltation structures will be maintained until removal is authorized by the Division and the disturbed area has been stabilized and revegetated. In no case will the structure be removed sooner than two years after the last augmented seeding. All impoundments will be reclaimed at the end of operations. sedimentation ponds not retained as part of the approved post-mining land use will be removed, the areas regraded, topsoiled, and revegetated (524.100-600). The estimated timeline for removal of impoundments is shown on Drawing 5-38, with expected removal in year four of the reclamation process. In areas where soils require stabilization following the removal of these sediment impoundments, silt fence will be appropriately installed and maintained to provide sediment control until stable conditions are met. When the siltation structure is removed, the land on which the siltation structure was located will be regraded and revegetated in accordance with the reclamation plan (Section 763.200).

Lower Robinson Creek will be reconstructed to its approximate original location. The design for this reconstruction is shown on Drawings 5-20A and 5-21A. This design includes considerable improvements to the channel compared to the channel's current condition, which is such that less than 25% of the channel within the disturbed area has a flood plain present, and most of the slopes are near the angle of repose and have only fair to poor vegetative cover. The reconstructed channel includes stable slope angles that will be revegetated, with a flood plain on both sides of the channel for the entire reconstructed length. The reconstructed channel will be sinuous, and rip-rap will be installed in the bottom of the channel to minimize erosion. The flood plain will be seeded and covered with erosion matting to control erosion until a natural vegetative condition can be attained (Section 742.323).

The Applicant commits in Sections 529 and 765 that, when no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures outlined in Sections 542.700 and 551 are designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed, unless otherwise managed in a manner approved by the Division. Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of "Administrative Rules for Water Well Drillers" (State of Utah Division of Water Rights) or other applicable state regulations, or by using a different procedure upon approval from the Utah State Engineer (Sections 529 and 765).

The Applicant submits that the geology restricts the flow of groundwater to the west. The same structure that directs and keeps groundwater in the Sink Valley trough limits its flow westward. Wells (piezometers) drilled in the north and western part of the permit area are said to have very little groundwater in the colluvial gravels. Whereas, wells and piezometers in the eastern and southern areas show higher potentiometric surfaces. The same is true in Sink Valley lying east of the permit area.

The applicant realizes that there is a good potential of intercepting groundwater as mining moves east. The applicant has discussed mitigation plans in the form of a grout curtain to stem the flow of groundwater to the pit. The applicant states in Section 724.500, if substantial groundwater flows into the mining areas as mining progresses towards alluvial springs and seeps in the eastern part of the permit area (Sink Valley), the conditions will be evaluated at the time they occur.

It appears to the Division that there is a good potential for the mine to intercept groundwater at a high rate as the mine develops east and as the walls of the mine pit are cut into the Sink Valley containment structure, (see Figure 8 A-A', App. 7-1 Petersen Hydrologic report, June 12, 2007 and App. 7-1 Petersen Hydrologic Report, Figure 6a, January 15, 2008). The applicant discusses using ground water resources secured from the town of Alton from water right 85- 744 for in mine use. This information was checked in the Utah Water Rights database. The town of Alton has ground water rights in Sink Valley for agricultural and municipal purposes. Alton Coal Development has purchased the use of 50 acre-feet per year and has an option to purchase more as necessary. The mine can use the water for development or temporary mitigation in the event state appropriated water is intercepted

The Applicant has not provided the basic details of surface contact with the Sink Valley aquifer, specifically the elevations of the mine contact with the alluvium of Sink Valley,

### **Findings:**

The information provided does not meet the requirements for hydrologic reclamation and mitigation described in the Coal Rules. Prior to approval, provide the following in accordance with:

**R645-301-731.214**, Hydrologic monitoring during reclamation can be assumed to be the same as during mine operation, but the Applicant needs to clarify the reclamation water monitoring plan. [JS]

**R645-301-745.120**, The Application must provide detailed cross sections showing the amount of open face that potentially intercepts ground water from Sink Valley. (see also deficiency written under R645-301-728.310). [DD]

(See also the deficiencies previously written under R645-301-731.800 in the hydrology operations section and "R645-301-742.312.1, -553.110, - 742.313, - 742.314," in the hydrology resource information section, concerning the unnatural and potentially unstable proposed final permanent configuration of Lower Robinson Creek which does not meet AOC requirements.)

## **CONTEMPORANEOUS RECLAMATION**

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

### **Analysis:**

#### **General**

Rough backfilling and grading is required for surface mining under R645-301-553. Operational sequence and contemporaneous reclamation sequence is shown on Dwg 5-17 through 5-19. The application describes contemporaneous reclamation of the pits in Section 341.100, and Section 528.200 and Section 542.

Section 341.100 on page 3-44 states that "A detailed schedule and timetable for the completion of each major step in the mine plan has been included in Chapter 5 of the MRP". Chapter 5 includes a detailed description of each step in the surface mining process. However there are no schedules or timetables included in chapter 5 that are pertinent to contemporaneous reclamation. Chapter 5 needs to be revised to include a detailed schedule and timetable for each major step in the mine plan.

The applicant requests a variance from reclamation in the 180 day period for the 8<sup>th</sup> pit as described in Section 542. Further discussion and a deficiency is written on this issue under R645-301-553, Backfilling and Grading.

#### **Findings:**

The information in the application is not adequate to meet the requirements of this section of the regulations. Further discussion and a deficiency is written on a variance from backfilling and grading requirements under R645-301-553, Backfilling and Grading. Prior to approval the following information must also be provided in accordance with:

**R645-301-352, -301-553**, Section 341.100 on page 3-44 states that "A detailed schedule and timetable for the completion of each major step in the mine plan has been included in Chapter 5 of the MRP." Chapter 5 includes a detailed description of each step in the surface mining process. However there are no schedules or timetables included in chapter 5 that are pertinent to contemporaneous reclamation. Chapter 5 needs to be revised to include a detailed schedule and timetable for each major step in the mine plan, including contemporaneous reclamation. [JH]

## **REVEGETATION**

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

#### **Analysis:**

##### **Revegetation: General Requirements**

The revegetation portion of the reclamation plan for the Coal Hollow surface mine is included in Chapter 3, Sections 341 through 358.530, pages 44 through 74.

### **Revegetation: Timing**

Chapter 5 of the application includes a detailed description of the completion of each major step in the mining process. Accordingly no more than 40 acres will be disturbed at any given time. Section 341.100 on page 3-44 states that "A detailed schedule and timetable for the completion of each major step in the mine plan has been included in Chapter 5 of the MRP". Chapter 5 includes a detailed description of each step in the surface mining process. However there are no schedules or timetables included in chapter 5 that are pertinent to contemporaneous reclamation. As noted in the section under Contemporaneous Reclamation, Chapter 5 needs to be revised to include a detailed schedule and timetable for each major step in the mine plan.

### **Revegetation: Mulching and Other Soil Stabilizing Practices**

**Task 2910 deficiency, R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275,** *"Section 341.230, page 3-53 of the application states that mulch will not be applied to the reclaimed pasture land. The applicant needs to provide a rationale for not using the mulch in this area. • Table 7 identifies the characteristics of the meadow and dry meadow plant communities as being conducive to sub-irrigation. Section 6.4 states that 'the topographic characteristics of most lands within the project area are compatible with flood irrigation techniques'. The application will need to include a mitigation plan for restoring water to these areas and might consider including the post mining land use of a 'developed water resource.' [JH]"*

Mulching techniques are described in Section 341.230, page 3-53 of the application. According to this information mulch will not be applied to the reclaimed pasture land. Granted this area is relatively flat and one of the primary uses of mulch is to control erosion. However there are additional beneficial uses for mulch. According to the United States Department of Agriculture research paper, Reclamation on Utah's Emery and Alton coal fields: Techniques and Plant Materials, INT-335, June 1985, page 24, "At the end of the first growing season, frequency of grass plants averaged 92 percent on the ripped area where hay had been rotovated into the soil surface compared to 52 percent on ripped areas receiving no hay amendment." Accordingly it seems reasonable for the applicant to consult with the division's soils and biology staff regarding mulch or soil amendments for the pasture land areas. The applicant also needs to explain how water will initially get to the reclaimed pasture areas, as there are no commitments in the plan to irrigate these reclaimed areas.

### **Revegetation: Standards For Success**

Standards for success are described in Section 356, pages 3-62 through 3-65 of the application. They will follow the requirements of R645-301-353 and "Appendix A, Vegetation Information Guidelines". Criteria for determining success include: Cover, Shrub Density, Frequency, Production and Diversity.

### **Findings:**

The information in the application is not adequate to meet the requirements of this section of the regulations. Prior to approval the following information must be provided in accordance with:

**R645-301-341.230**, According to the Application, mulch will not be applied to the reclaimed pastureland. The beneficial uses for mulch are outlined in the United States Department of Agriculture research paper, Reclamation on Utah's Emery and Alton coal fields: Techniques and Plant Materials, INT-335, June 1985, page 24, "At the end of the first growing season, frequency of grass plants averaged 92 percent on the ripped area where hay had been rotovated into the soil surface compared to 52 percent on ripped areas receiving no hay amendment. The application must include a commitment to apply mulch or soil amendments for the pastureland areas. • The applicant also needs to explain how water will initially get to the reclaimed pasture areas, as there are no commitments in the plan to irrigate these reclaimed areas. [JH]

## **STABILIZATION OF SURFACE AREAS**

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

### **Analysis:**

Stockpiled topsoil and subsoil will be bermed and seeded. These stockpiles cover 17.53 acres (Dwg. 2-2). Seeding of spoil piles is planned for piles that exist longer than a year (Sec. 528.310, p. 5-40.)

Areas adjacent to primary roads will be stabilized and vegetated (Sec. 526.400).

Haul roads will be watered or be treated with dust suppressants and a 15 mph speed limit will be imposed (Sec. 526.400 and App. 4-2).

Slopes of the contemporaneous reclaimed acreage will be less than 3h:1v and will be seeded and mulched after topsoil placement. Lands reclaimed to pasture will not be mulched, however (Sec. 244.200). Grass matting may also be used (Sec. 242.130 (c)) and a variety of techniques and materials may be used depending on the reclaimed area (Sec. 244.200).

Construction of the overburden/excess spoil stockpile created from mining Pits 1 – 8 and as mining progresses from Pits 9 – 15 is described in Sec. 528.200. Staged reclamation is shown on Dwg 5-19. Section 532.300 states that topsoil will be applied to graded areas within 90 days. Major steps in the backfilling and grading described in Section 553 seem to be specific to the mined out areas. The application should clearly state the timetable for final grading of the excess spoil pile. Will final grading of the spoil pile be concurrent with construction of the pile, such that overburden from pits 1 – 3 that constitute the 2.7 million cubic yards of spoil placed on the un-mined areas will receive final grading while overburden from pits 4 – 8 is placed in the mined area?

The application specifies that seeding and mulching of the excess spoil pile will be contemporaneous with the staged approach to building the pile. i.e., First the 2.7 million cubic yards from Pits 1 – 8 will be seeded and mulched immediately after regrading and the additional 2,500 feet extension of the excess spoil pile from Pits 9 – 15 will be reclaimed contemporaneously as well. The regrading of the excess spoil to a 3h:1h slope is described in Sec. 528.310. The reclamation timetable provided in Section 540 indicates that regraded areas will be topsoiled as soon as possible and within 90 days of final grading (pg. 5-58). Information provided on the timing of seeding is confusing. The seeding schedule is alternately described as immediately following topsoil application (pg. 2-27 and pg 5-57) or as seasonal in nature (p. 5-58) mainly occurring in early spring and late fall (pg. 2-27).

The replacement of overburden into the mined out pit will take place within 60 days (Section 553, p. 5-65). Statements on pages 5-57 and 5-66 referring to 180 day backfilling and grading of mined areas and the statement on page 5-59 referring to 15 months required for final pit backfilling seem to contradict the 60 day requirement of R645-301-553 for backfilling and grading (see deficiency written under Reclamation Plan/Backfilling and Grading Findings R645-301-553 and R645-301-121.200).

The replacement of the topsoil will occur within 90 days of backfilling and grading (p. 5-58). Areas observed to be impacted by compaction due to heavy equipment will be ripped, disked, and harrowed prior to seeding. Areas that are not compacted will be roughened slightly with dozer tracks prior to seeding (Section 242.120 (b)). The timetable for reclamation provided in Section 542 is specific about the mined out area, but not the spoil pile.

Treatment of rills and gullies is described in Section 244.200 and in Section 244.320 (b).



**Findings:**

The information provided in the application does not meet the requirements of the R645 Coal Rules for Soil Stabilization. Prior to approval, please provide the following, in accordance with:

**R645-301-234.230**, The application should clearly state the timetable for final grading of the excess spoil pile. Will final grading of the spoil pile be concurrent with construction of the pile, such that the 2.7 million cubic yards of spoil from pits 1 – 3 that are placed on the unmined area will receive final grading, while overburden from pits 4 – 8 is placed in the mined area? (Repeated from Task 2910). • The seeding schedule is alternately described as immediately following topsoil application (pg. 2-27 and pg 5-57) or as seasonal in nature (p. 5-58) mainly occurring in early spring and late fall (pg. 2-27). Seeding of the spoil piles is described only for piles that exist longer than a year (Sec. 528.310, p. 5-40.) The application should specify in Chapter 2 and Chapter 5 that seeding will immediately follow topsoil application, regardless of season. [PB]

**CESSATION OF OPERATIONS**

Regulatory Reference: 30 CFR Sec. 817.131, 817.132; R645-301-515, -301-541.

**Analysis:**

The Applicant met the requirements. In Section 515.300 of the PAP, the Applicant commits to follow the notification procedures and otherwise secure the site.

**Findings:**

Information provided in the application Section 515 mimics the Coal Rules and therefore meets the requirements for Emergency and Temporary Cessation Reporting.

**MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS**

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

**Analysis:**

### **Affected Area Boundary Maps**

Affected area boundary maps for vegetation and fish and wildlife information are located in Volume 3, Chapter 5, Plates 5-1, 2, 9, 10, 13, 14, and 5.

Map 1-2, Project Area LBA shows the project area and the proposed expansion for the federal leases. Map 5-10, Coal Removal Sequence, shows only the anticipated dates for when coal would be mined in the permit areas. Coal recovery from expansion areas will be requested within ninety days of final reclamation of Pit 24, see Reclamation Plan/Backfilling and Grading Findings in this Technical Analysis.

### **Bonded Area Map**

The Applicant did not meet the requirements of this section. The Applicant shows on Drawing 5-3 that access to the mine will be from a road branching off from a closed portion of County Road 136. That access road has been included within the permit area.

The following drawings depict the permit area to be bonded prior to receipt of a Utah mining permit:

- 5-1...Pre-Mining Topography
- 5-2...Disturbance Sequence
- 5-9...Coal Extraction Overview
- 5-10...Coal Removal Sequence
- 5-13...Strip Ratio Isopach
- 5-14...Coal Thickness
- 5-15...Overburden Isopach.

### **Reclamation Backfilling And Grading Maps**

The following drawings depict the areas which are to be reclaimed, following coal recovery:

- 5-38...Reclamation Sequence
- 5-35...Post-Mining Preferred Topography
- 5-36...Post-Mining Preferred Cross Sections
- 5-37...Post-Mining Alternate Topography
- 5-37A...Post-Mining Alternate Cross Sections.

The Division previously requested cross sections that show how the site will be reclaimed in the event that the federal leases are not acquired. Alton Coal Development has provided Drawing 5-37A which depicts cross sections of the Alternate Scenario reclamation. Drawing 5-37 depicts the plan view. Both drawings are P.E. certified by Mr. Chris McCourt, Utah registered professional engineer.

The Alternate Scenario is the reclamation plan which will be implemented if ACD does not acquire adjacent federal leases.

ACD has also provided cross-sections and plan view of the "preferred reclamation scenario" (Drawing 5-35 and Drawing 5-36). Both drawings are P.E. certified. Drawing 5-37A shows the cross sections where coal is to be re-covered and the areas where backfilling and grading will occur. Cross sections depict a reclamation plan that will re-establish a smooth contour from high wall crest to high wall crest (See sections A-A', B-B', C-C', D-D' E-E' and F-F'). The applicant has adequately addressed this deficiency.

### **Reclamation Facilities Maps**

Task 2910 deficiency, *"The Applicant must either list in the PAP or show on a reclamation map those facilities that will remain after final reclamation or state specifically in the PAP that all facilities will be removed at final reclamation"*.

The Applicant has provided Drawings 5-35 and 5-37 which depict plan views of both the preferred reclamation scenario and the alternate reclamation scenario. Drawings 5-35 and 5-37 show that all surface facilities relative to coal recovery and loading will be removed, with the exception of the solar powered water well.

Kane County Roads K3900 and K3993 will be reconstructed as part of the post-mining land use. Drawing 5-22C shows plan, gradient and cross-section drawings for the 12 foot and 24 foot roads which will be retained / re-constructed to the Pugh property.

Drawing 5-22D depicts a plan, gradient and cross-section for the 24 foot road which will be retained / reconstructed to access the water well, which is also to be retained.

Drawing 5-22E shows plan, gradient and cross section for 6,041 feet of County Road #136 (K3900) reclamation.

Drawing 5-22F shows plan, gradient and cross section for 3,234 feet of County Road #136 (K3900) reclamation.

See Findings written under Reclamation/Road Systems and Other Transportation Facilities section of this Technical Analysis for deficiencies with the road reclamation plan.

#### **Final Surface Configuration Maps**

R645-301-542.300 Final Surface Configuration Maps are specific to underground mining.

#### **Reclamation Monitoring And Sampling Location Maps**

Vegetation monitoring and sampling locations map was not found.

The application states that ground- and surface-water monitoring will continue through the post-mining periods until bond release. The monitoring requirements, including monitoring sites, analytical parameters and the sampling frequency may be modified in the future in consultation with the Division if the data demonstrate that such a modification is warranted (Section 731.200).

#### **Reclamation Surface And Subsurface Manmade Features Maps**

#### **Reclamation Treatments Maps**

The reviewer is referred to Drawing 5-20 and 5-20A. 5-20 shows the location of the temporary diversion in Robinson Creek and is not a reclamation treatment map. Drawing 5-20A is adequate to show the reclamation treatments for Robinson Creek. The application needs to also include the reclamation treatment maps for the reclaimed areas including a delineation of any areas where a different seed mix or rate of application is proposed such as sage grouse habitat and pasture restoration.

### **Certification Requirements.**

The Applicant met the requirements of this section. The Applicant had all pertinent maps and cross-sections certified by a registered professional engineer.

### **Findings:**

The information in the application is not adequate to meet the requirements of this section of the regulations. Prior to approval the following information must be provided in accordance with:

**R645-301-323,** The application needs to include Reclamation Monitoring And Sampling Location Maps and Reclamation Treatments Maps. Drawing 3-1 includes the location of the reference areas where vegetation was sampled prior to disturbance and will be sampled post reclamation. Drawing 3-1 needs to include the post reclamation sampling locations of the reclaimed area. •The applicant should also address the remaining portions of R645-301-323 in consultation with the Division. The portions include 323.200, 300, and 400. •For Reclamation Treatments Maps the reviewer is referred to Drawing 5-20 and 5-20A. 5-20 shows the location of the temporary diversion in Robinson Creek and is adequate to show the reclamation treatments for Robinson Creek, but the application needs to include the reclamation treatment maps for the other reclaimed areas, showing topography and delineation of areas where a different seed mixes or rate of application is proposed, such as sage grouse habitat and pasture restoration. [JH]

## **BONDING AND INSURANCE REQUIREMENTS**

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

### **Analysis:**

#### **General**

The Applicant met the requirements of this section. The Division will process the permit application without requiring the Applicant to acquire a bond. However, the Division cannot issue a permit until the bond is posted.

#### **Form of Bond**

To date, Alton Coal Development, LLC, has not posted a reclamation bond with the Division. The Division's standard practice is to process the permit application without requiring

the Applicant to acquire a bond. The Applicant will meet the requirements of this section prior to permit issuance.

### **Determination of Bond Amount**

The Division is extracting information from the permit application package in order to determine a precise reclamation bond amount for the Coal Hollow project.

The Division's ball-park estimate based upon \$ 5,500 per acre of disturbance and an anticipated 435 acres disturbance (See Drawing 5-2, Disturbance Sequence) is a bond amount of \$2,392,500.

Alton Coal Development must provide a detailed cost estimate, with supporting calculations for the following Coal Hollow areas;

- 1) Demolition of the Facilities and Structures / Loadout as shown on Drawing 5-4.
- 2) Reclamation costs for ponds 2 and 3, including backfilling and grading, re-soiling and re-vegetating.
- 3) Reconstruction of Robinson Creek
- 4) Total Reclamation Costs for Stage 1, to include backfilling and grading, topsoiling and re-vegetation of the 69 acres associated with the mining area.
- 5) Total Reclamation Costs for Stage 2, to include backfilling and grading, topsoiling and re-vegetation of the 68 acres.
- 6) Total Reclamation Costs for Stage 3, to include backfilling and grading, topsoiling and re-vegetation of the 99 acres.

These total costs must include reclamation costs for the final (or Stage 3 remaining pit) pit area depicted on Drawing 5-19.

- 7) Total Reclamation Costs for the Stage 1 excess spoil reclamation.

The Division needs the Stage 1, 2 and 3 costs broken out such that incremental bonds may be implemented for the coal mining area in accordance with the requirements of R645-301-820.111, 820.112 through 820.133, and in agreement with Alton Coal Development.

### **Terms and Conditions for Liability Insurance**

The Applicant met the requirements of this section. Liability insurance form is found in Appendix 1-4.

**Findings:**

The information provided in the permit application is considered adequate to meet the requirement of this section at this point in the permitting process. The Division will determine the bond amount after receipt of requested information describing the operation and reclamation plan. In addition, prior to approval, the application must provide the following, in accordance with:

**R645-301-830.140, Detailed Cost Estimates,** The Division needs the Stage 1, 2 and 3 costs broken out such that incremental bonds may be implemented for the coal mining area in accordance with the requirements of **R645-301-820.111, 820.112 through 820.133**, and in agreement with Alton Coal Development. Alton Coal Development must provide a detailed cost estimate, with supporting calculations for the following Coal Hollow areas:

- 1) Demolition of the Facilities and Structures / Loadout as shown on Drawing 5-4.
- 2) Reclamation costs for ponds 2 and 3, including backfilling and grading, re-soiling and re-vegetating.
- 3) Reconstruction of Robinson Creek
- 4) Total Reclamation Costs for Stage 1, to include backfilling and grading, topsoiling and re-vegetation of the 69 acres associated with the mining area.
- 5) Total Reclamation Costs for Stage 2, to include backfilling and grading, topsoiling and re-vegetation of the 68 acres.
- 6) Total Reclamation Costs for Stage 3, to include backfilling and grading, topsoiling and re-vegetation of the 99 acres.
- 7) These total costs must include reclamation costs for the final (or Stage 3 remaining pit) pit area depicted on Drawing 5-19.
- 8) Total Reclamation Costs for the Stage 1 excess spoil reclamation. [PH]

---

SPECIAL CATEGORIES

---

# **REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING**

## **INTRODUCTION**

Regulatory Reference: 30 CFR Sec. 785; R645-302, et seq.

### **Analysis:**

There is a possibility of an Alluvial Valley Floor (AVF) being present. The Division is currently analyzing this and has asked for additional information.

### **Findings:**

A determination of an AVF is still pending.

## **OPERATIONS IN ALLUVIAL VALLEY FLOORS**

Regulatory Reference: 30 CFR Sec. 822; R645-302-324.

### **Analysis:**

See the above discussion of Alluvial Valley Floors in the Environmental Resource Information section.

### **Findings:**

A determination of an AVF is still pending.



## **CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)**

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

### **Analysis:**

The Division will provide a CHIA.

### **Findings:**

The Division will provide a CHIA.

O:\025005.COL\FINAL\WG3100\editTA\_3100.doc